AD-A083 113 BOEING AEROSPACE CO SEATTLE WA BOEING MILITARY AIRPL--ETC F/G 9/2
COMPUTER PROGRAM DEVELOPMENT SPECIFICATION FOR IDAMST OPERATION--ETC(U)
NOV 76 F33615-76-C-1099
UNCLASSIFIED SPEC-SB-4042 AFAL-TR-76-208-ADD-2 NL

1 of 3
AD
A083 113

AFAL-TR-76-208, Addendum #2

SPECIFICATION
SB 4042

A047163
A055940

LEVEL III

1 ms

6 COMPUTER PROGRAM DEVELOPMENT SPECIFICATION
FOR IDAMST OPERATIONAL FLIGHT PROGRAMS
Addendum 2 APPLICATIONS SOFTWARE.

ADA083113

Prepared by

THE BOEING AEROSPACE COMPANY
BOEING MILITARY AIRPLANE DEVELOPMENT
SEATTLE, WASHINGTON

11 NOV[redacted]76

14 SPEC-SB-4042

18 AFAL

19 TR-76-208-ADD-2

12 267

15 F33615-76-C-1099

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

PREPARED FOR

AIR FORCE AVIONICS LABORATORY
AIR FORCE SYSTEM COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AFB, OHIO 45433

80 4 15 059

410258

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

FOREWORD

This document establishes performance and design requirements for the IDAMST Operational Flight Program Applications Software.

It was prepared for the Air Force Avionics Laboratory under Contract Number F33615-76-C-1099, in fulfillment of Contract Data Requirement List item 0001, sequence number 7.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

ADC	Air Data Computer
ADF	Automatic Direction Finder
AFAL	Air Force Avionics Laboratory
AMST	Advanced Medium STOL Transport
BCIU	Bus Controller Interface Unit
CARP	Computed Air Release Point
CCA	Column Control Assembly
CCIP	Continually Computed Impact Point
CCT	Combat Control Team
CRT	Cathode Ray Tube
DAIS	Digital Avionics Information System
DEK	Data Entry Keyboard
DITS	Digital Integrated Test System
DS/MU	Display Switch/Memory Unit
ECM	Electronic Counter Measure
EFCS	Electronic Flight Control System
EHARS	Error Handling and Recovery Software
FCS	Flight Control System
GMT	Greenwich Mean Time
IDAMST	Integrated Digital Avionics for a Medium STOL Transport
IFF/SIF	Identification Friend or Foe/Selective Identification Feature
ILS	Instrument Landing System
HCU	Hand-Controller Unit
HF/SSB	High Frequency/Single Side Band
HSD	Horizontal Situation Display
HUD	Head-Up Display
IMK	Integrated Multifunction Keyboard
INS	Inertial Navigation System
LAPES	Low Altitude Parachute Extraction System
MCL	Master Caution Light
MDSC	Modular Digital Scan Converter

MFDC	Multi-Function Display Controls
MMK	Master Mode Keyboard
MMU	Mass Memory Unit
MPD	Multi-Purpose Display
MPDG	Modular Programmable Display Generator
OFP	Operational Flight Program (Software)
OPS	Operational Sequencer
RF	Radio Frequency
RTU	Remote Terminal Unit
SCP	Sensor Control Panel
SKE	Station Keeping Equipment
STOL	Short Take-Off and Landing
TACAN	Tactical Air Navigation
TM	Tailored Mode
T/R	Transmit/Receive
T/R+G	Transmit/Receive Plus Guard
UHF	Ultra High Frequency
VHF	Very High Frequency
VLF	Very Low Frequency
ZM	Zone Marker

1.0 SCOPE

1.1 IDENTIFICATION

This part of this specification establishes the requirements for performance, design, test, and qualification of a computer program identified as IDAMST Operational Flight Program Applications Software.

1.2 FUNCTIONAL SUMMARY

This document specifies the software functional requirements for the AMST Mission Scenario, ~~defined in Reference 2.1~~.1(a), Appendix A. Applications Software functions consist of providing the calculation and control capability necessary for the following mission/operations task areas:

- Flight and Propulsion,
- Communications,
- Navigation and Guidance,
- Payload,
- Aircraft Systems,
- Defense.

Section 2.0 contains a list of government/non-government documents which contribute to this specification.

Section 3.0 describes the design and structure of the Applications Software, and details the hardware/software interface and functional requirements.

Section 4.0 contains procedures to test and verify the Applications Software.

Section 5.0 (Preparation and Delivery) is not applicable.

Section 6.0 contains a description of identified growth areas: JTIDS, TF/TA, GPS.

Section 10.0 contains a complete IDAMST signal list.

2.0 Applicable Documents

2.1 Government Documents

2.1.1 Appendices to Contract F33615-76-C-1099 Statement of Work (SOW).

(a) Appendix A - "AMST Mission Profile and Scenario (updated)".

(b) Appendix C - "System Architecture".

(c) Appendix E - "DAIS Mission Software, OFP Applications (SA-201-303)", 17 Jan 76.

(d) Appendix F - "DAIS Mission Software, Executive (SA-201-320)", 26 Dec 75.

(e) Appendix H - "Software Management Plan".

(f) Appendix M - "TRW System Backup and Recovery Strategy (TRW 6404-5-6-06)", Sept 75.

2.1.2 DAIS Documents (Reference)

2.1.2.1 ICD - Mission Operation Sequence

Pilot/Controls and Displays/Interface with Application Software (SA-803-200), 15 March 76.

2.1.2.2 Mission Software/Controls and Displays Interface (SA-802-301), 12 March 76

2.1.2.3 DAIS System Control Procedures, (SA-100-101 Appendix A), 7 Nov 75.

2.1.3 IDAMST Documents (Program generated).

2.1.3.1 Computer Program Development Specification, IDAMST OFP Executive (SB 4041), July 76.

2.1.3.2 Computer Program Development Specification, IDAMST OFP Error Handling and Recovery (SB 4043) July 76.

2.1.4 IDAMST Documents (Reference)

The following documents, because of release dates, serve only as reference documentation for this specification; however, are considered prime to further definition of the IDAMST system design.

2.1.4.1 System Specification for IDAMST, Type A (S1-1010), June 76.

2.1.4.2 Prime Item Development Specification, IDAMST Processor, Type B1 (S1-4030), June 76.

2.1.4.3 System Segment Specification, IDAMST Control/Display Subsystem, Type A (S1-5020), June 76.

3.0 REQUIREMENTS

This section contains interface and functional requirements for the IDAMST OFP Applications Software.

The AMST mission defined in Reference 2.1.1, Appendix A "AMST Mission Profile and Scenario" requires avionics software support in the areas of flight and propulsion, communications, navigation and guidance, payload, aircraft systems, and defense. The Applications Software provides the support necessary to satisfy the design and performance requirements for these mission areas. These support functions include:

- C&D control
- Sensor control
- Specialized calculations (e.g., navigation, CARP)
- Equipment health monitoring
- Status maintenance
- Mission mode control
- Limited software reconfiguration

An overview scenario of the AMST mission is shown in Figure 3.0-1.

3.1 COMPUTER PROGRAM DEFINITION

3.1.1 Interface Requirements

This section describes interface requirements imposed on the Applications Software design by other IDAMST equipment/computer programs.

Figure 3.1-1 identifies the three computer program configuration items comprising the OFP software subsystem for IDAMST. The Applications Software functionally interfaces with the AMST hardware subsystems integrated into IDAMST. This functional interface is shown by dashed lines on Figure 3.1-1 as a part of the OFP Executive Software. Overall control of interface operations is provided by the Executive.

The basic IDAMST software design and core element hardware design (provessors, data bus, remote terminals and control/displays core elements) are influenced by the Digital Avionics Information System (DAIS) design currently being developed by the Air Force Avionics Laboratory (AFAL). This is evidenced by specific architectural design requirements stated in this specification (Section 3.1.2). Also imposed on the OFP software as design considerations are guidelines and techniques for structured software design as noted in Sections 9 and 10 of Reference 2.1.1, Appendix H "Software Management Plan".

The relevant characteristics of the IDAMST core element hardware effecting the OFP applications software design are defined in Reference 2.1.1, Appendix C "System Architecture".

3.1.1.1 Interface Block Diagram

Figure 3.1-2 is a block diagram of the IDAMST system. Three mission processors are employed in which the OFP Applications Software resides in support of the AMST mission. Overall system control is directed by the Executive Software,

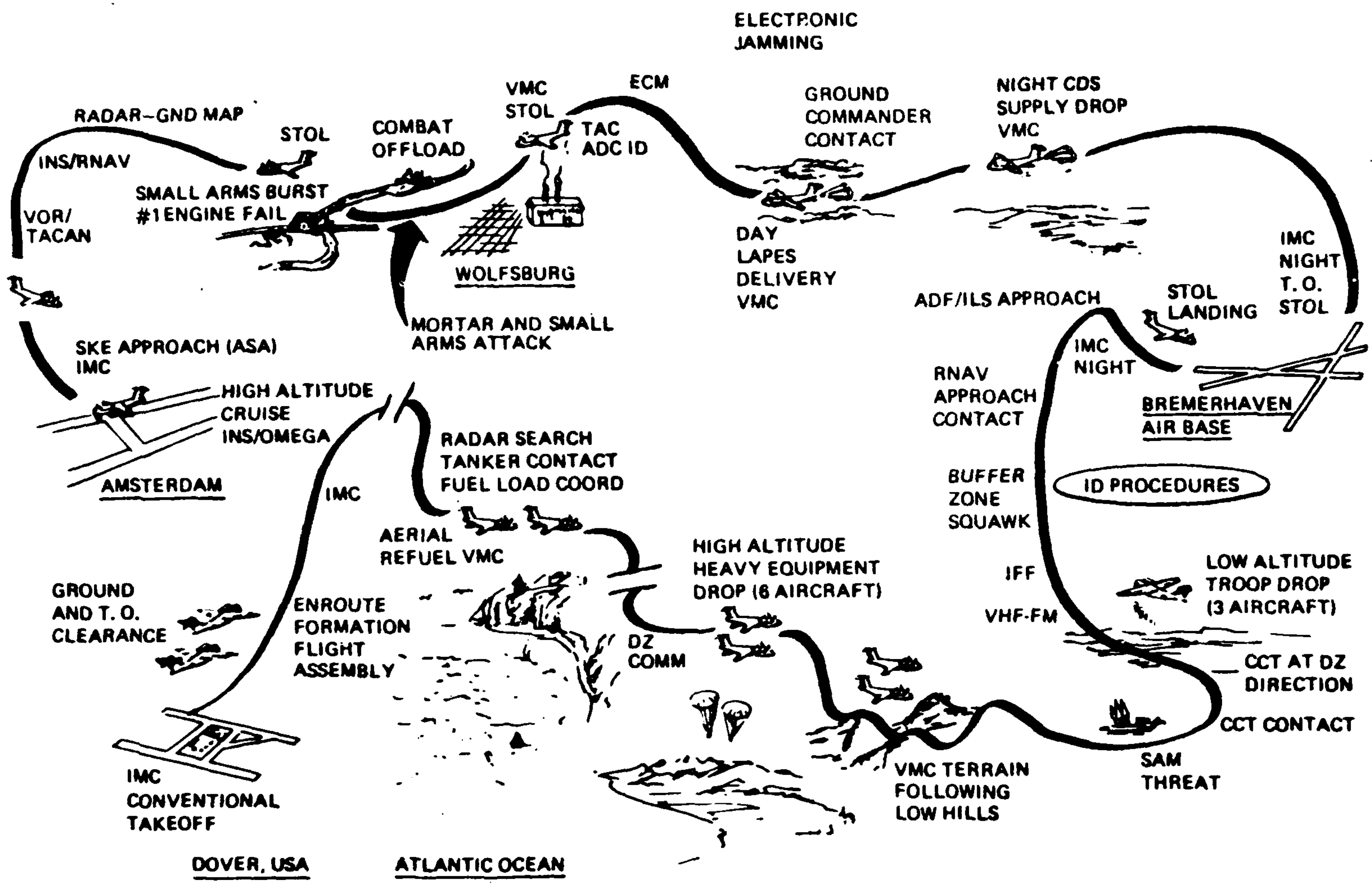


Figure 3.0-1 *IDAMST Composite Mission Requirements*

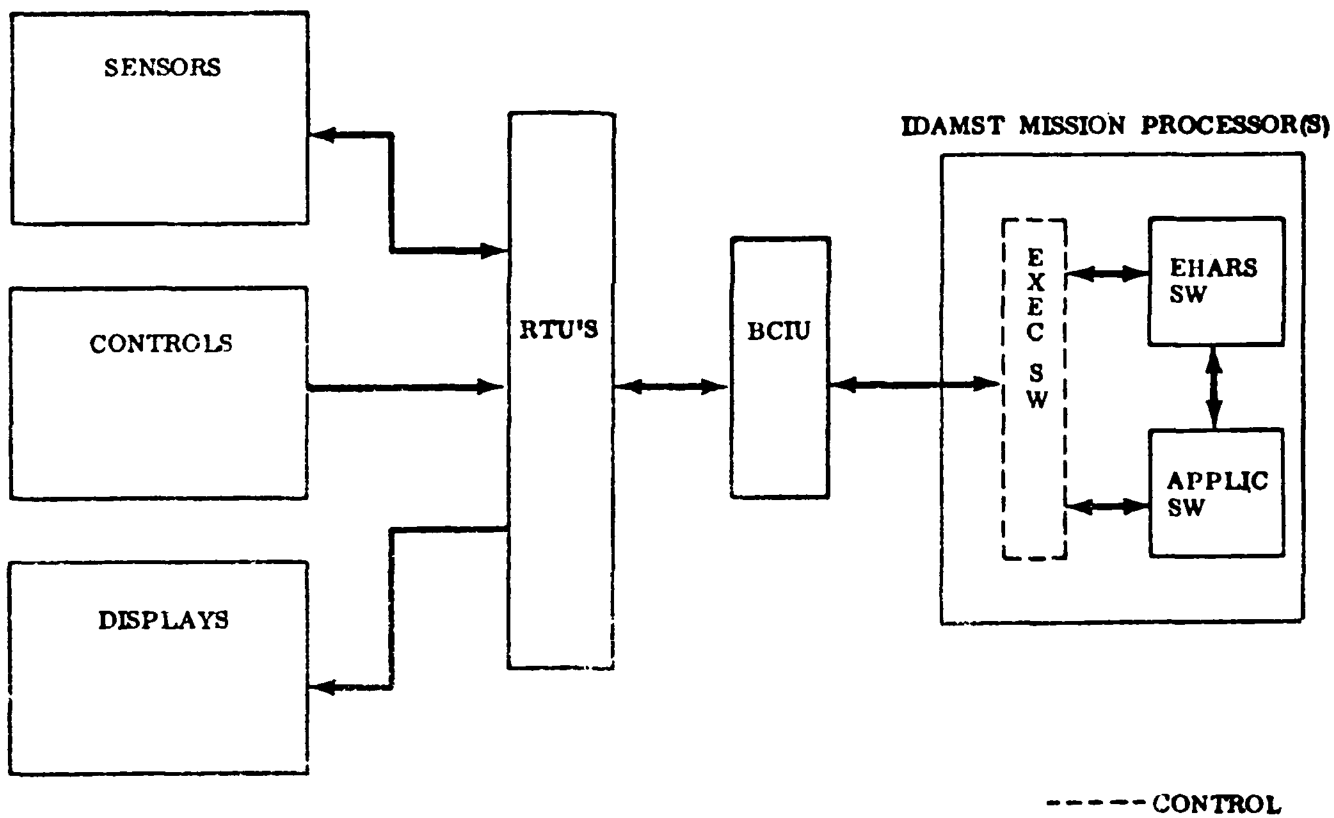


FIGURE 3.1-1 IDAMST OFP INTERFACES

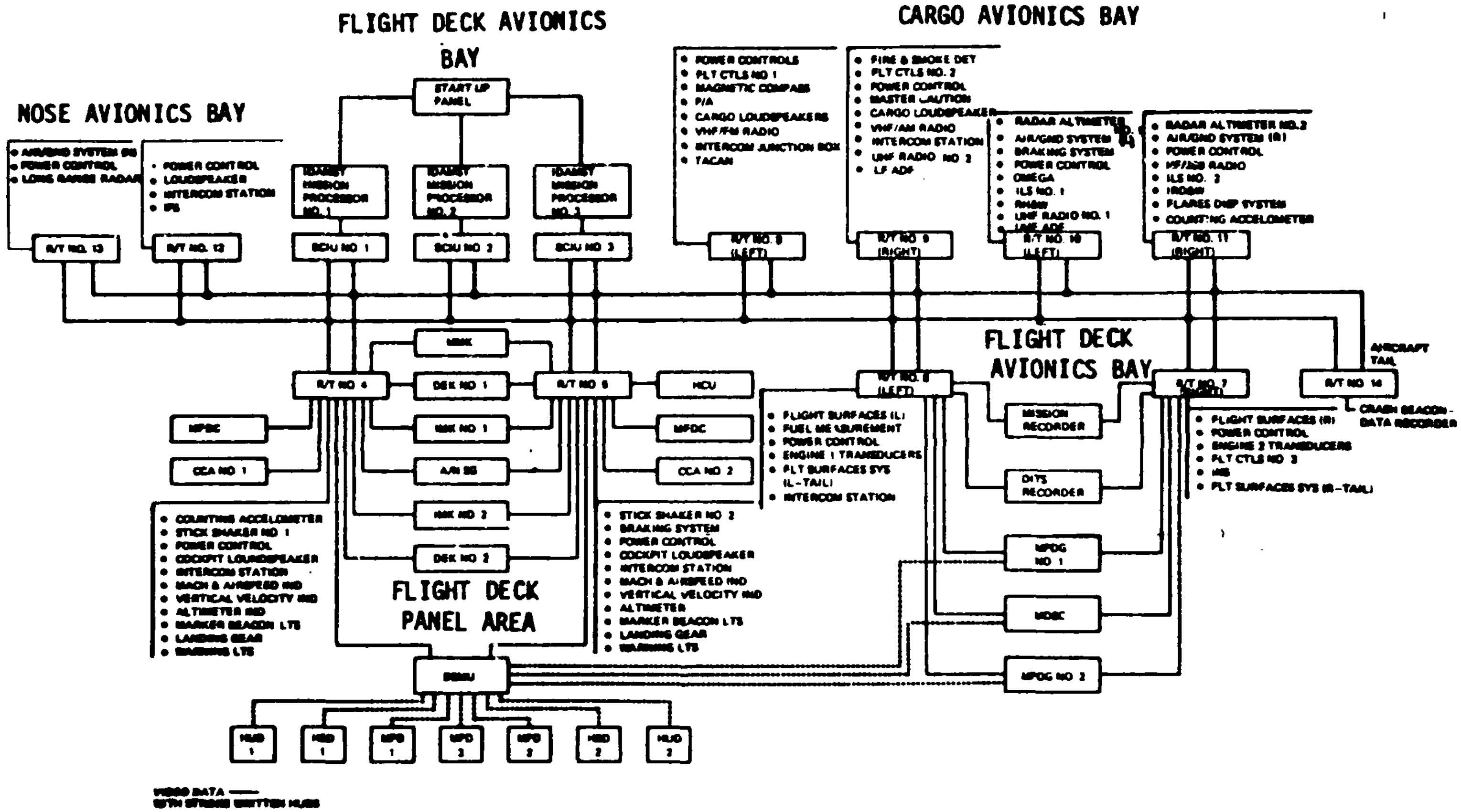


FIGURE 3.1.2: IDAMST SYSTEM BLOCK DIAGRAM

including control of the functional interfaces between the Applications Software and the IDAMST system hardware. The task of the Executive with respect to these hardware/software interfaces is to make the mechanization of data transfer transparent to the Applications Software and thereby decouple the system core element hardware programming considerations from the purely functional Applications Software tasks. To the Applications Software, the task of communicating with IDAMST system hardware is essentially the formatting, ordering, and generation or interpretation of avionics hardware parameter (signal) lists.

3.1.1.2 Detailed Interface Definition

The intent of this paragraph and subparagraphs is to define the functional relationships of the Applications Software to the IDAMST system hardware and associated OFP software (Executive and EHARS).

3.1.1.2.1 IDAMST System Hardware Interfaces

Figure 3.1-2 illustrated the IDAMST system hardware in block diagram form. Figure 3.1-2.1 is the complete IDAMST equipment/disposition list.

The Executive software is tasked with the responsibility of making the mechanism and frequency of communication transparent to the Applications Software. Programming considerations imposed by the core element design are not apparent to the Applications Software. Therefore the Applications Software/hardware interfaces can be described by a signal list. Figure 3.1-3 is an example of such a list which is required to define the functional interface to the avionics hardware. The Application Software/IDAMST Hardware interface shall be as listed in Section 10.

3.1.1.2.2 Function Identification

Figure 3.1-4 identifies the selected functions for IDAMST requiring Applications Software support. These functions are categorized into six basic mission/operations task areas:

- Flight and Propulsion
- Communications
- Navigation and Guidance
- Payload
- Aircraft Systems
- Defense

3.1.1.2.2.1 Flight and Propulsion

The IDAMST functions in this category are those associated with pilot/copilot control and management of the AMST flight. Five subcategories are identified:

- Crew Displays
- Crew Controls
- Flight Control System
- Weights and Balance
- Energy Management

INSTRUMENT & AIRCRAFT SYSTEMS

AVIONICS

[illegible]

CONTROLS & DISPLAYS

[illegible]

CONTROLS & DISPLAYS

[illegible]

NAVIGATION SYSTEMS

AVIONICS

[illegible]

CONTROLS & DISPLAYS

[illegible]

COMMUNICATION SYSTEMS

AVIONICS

[illegible]

CONTROLS & DISPLAYS

[illegible]

ELECTRONIC COUNTERMEASURES SYSTEMS

AVIONICS

[illegible]

CONTROLS & DISPLAYS

[illegible]

RADIO AIDS TO NAVIGATION

AVIONICS

[illegible]

CONTROLS & DISPLAYS

[illegible]

PAYLOAD SYSTEMS

AVIONICS

[illegible]

CONTROL & DISPLAYS

[illegible]

IDAMST EQUIPMENT/DISPOSITION LIST

FIGURE 3.1-2.1

B

2 5 0 INERTIAL NAVIGATION SYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HEADS UP DISPL IN 1	25015	10					208	2	416
MAG HEADING BAD	25029	1	+28 VDC		28VDC=TRUE		1	4	4
RANGE TO DEST UNITS	25023	9		0/9		1/2 MILE PR	14	4	56
RANGE TO DEST TENS	25024	9		0/90			14	4	56
RANGE TO DEST HDRDS	25025	9		0/900			14	4	56
DEST REL BEARING	25026	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
MAG HEADING	25027	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
ATTITUDE GOOD	25022	1	A/C+28 VDC		28VDC=TRUE		1	8	8
HEADING/SET	26002	10					32	16	512
STEERING ERROR	25030	5		+-10 DEG	150 UA/10 DEG	1/16 DISP	11	32	352
ROLL	25018	9		0/360 DEG	1DEG=1DEG	0.1 DEG RMS	14	32	448
PITCH	25021	9		+-90 DEG	1DEG=1DEG	0.1 DEG RMS	14	64	896

FIGURE 3.3-3: IDAMST SIGNAL LIST OF APPLICATIONS SOFTWARE (EXAMPLE)

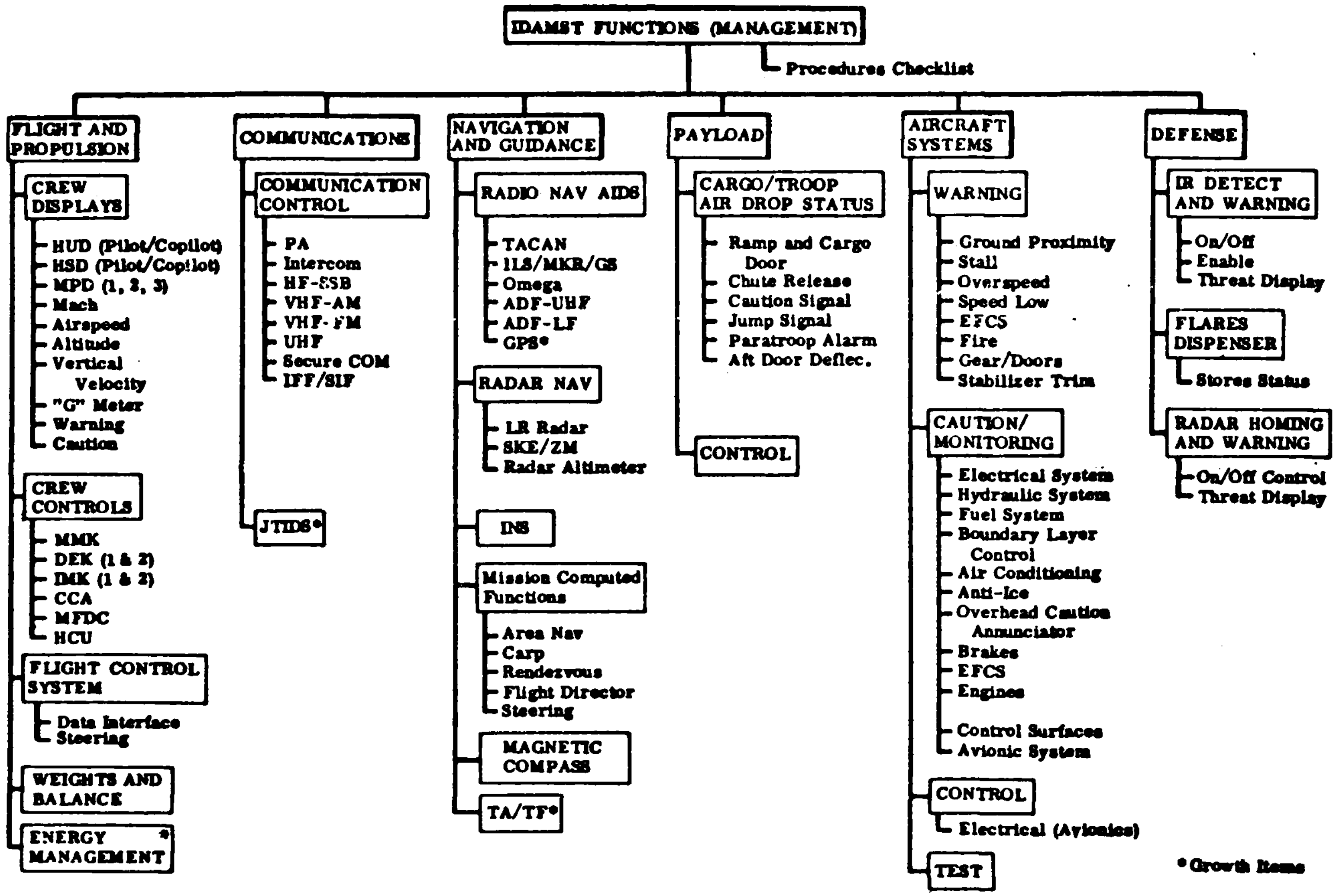


FIGURE 3.1-4 IDAMST FUNCTION IDENTIFICATION LIST

Figure 3.1-5 is a cockpit layout of the controls and displays integrated into the IDAMST system.

3.1.1.2.2.1.1 Crew Displays

The Application Software shall transfer formatted parameter lists and control commands to the various IDAMST display devices. These devices are divided into two categories:

- o CRT displays
- o Dedicated displays

CRT Displays

CRT-type displays integrated into the IDAMST system are:

- o HUD (pilot's, co-pilot's)
- o HSD (pilot's, co-pilot's)
- o MPD (pilot's, co-pilot's, center)
- o IMK (pilot's, co-pilot's)

Functionally the interface between the HUD, HSD, MPD displays and the Applications Software shall be a list of ordered parameters and control data transmitted to the Modular Programmable Display Generator (MPDG). Display formatting and symbol generation is the task of the MPDG. Table 3.1-1 lists the parameters and types of information to be displayed on the HUD, HSD, and MPD.

The interface between the IMK CRT and the Applications Software shall be control and page identification transmitted to the Alpha/Numeric Symbol Generator.

Dedicated Displays

Several dedicated displays have been integrated into the IDAMST system. The following displays shall be controlled by the Applications Software.

- o Mach
- o Airspeed
- o Altitude
- o Vertical Velocity
- o 'G' Meter
- o Warning Lights
  - EFCS
  - Speed Low
  - Ground Proximity Warning
- o Marker Beacon Lights

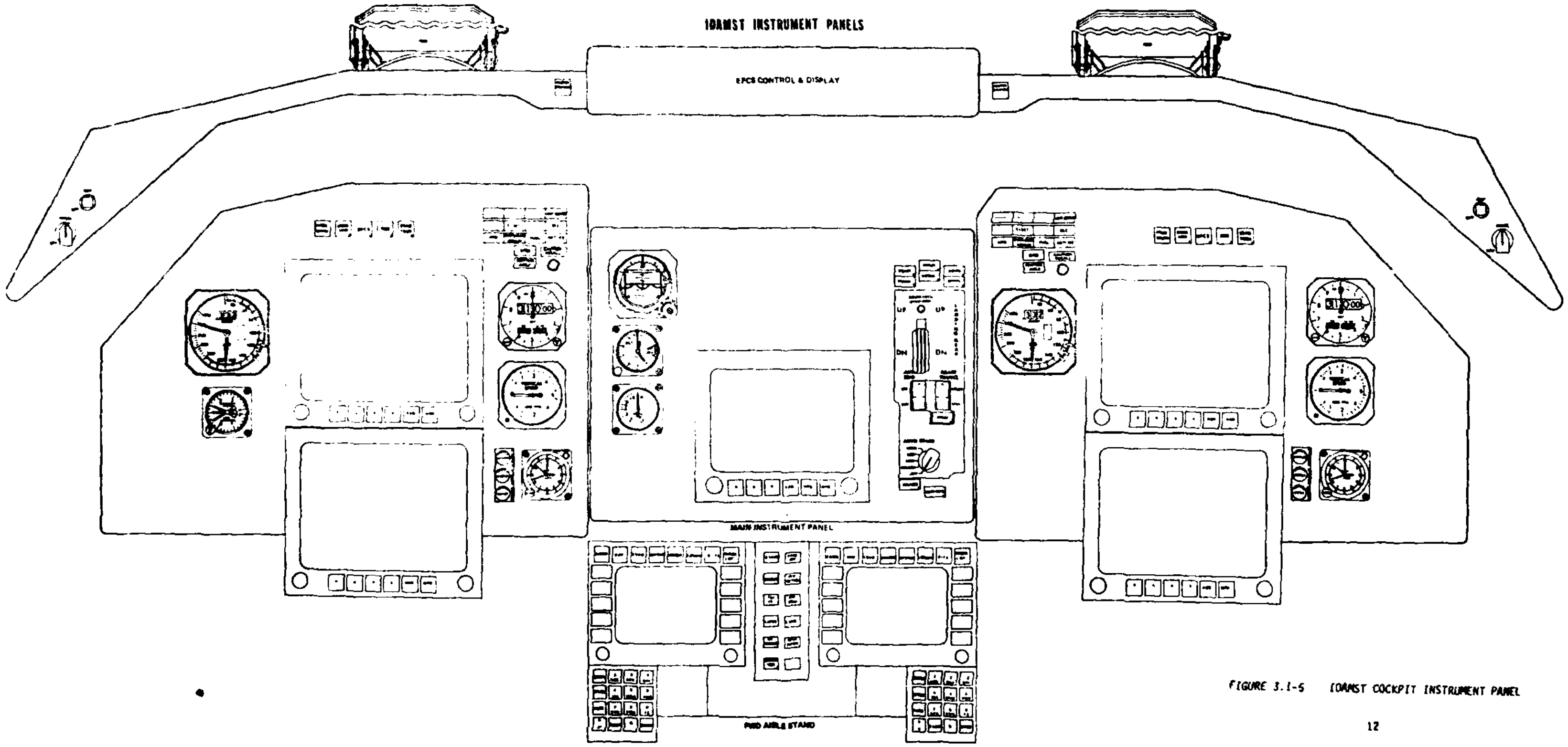


FIGURE 3.1-5 IOAMST COCKPIT INSTRUMENT PANEL

HUD FUNCTIONS (VSD ALTERNATE)	HSI DISPLAY	MAP DISPLAY	MPD FUNCTIONS
Attitude (Pitch & Roll)	Distance to Waypoint	MAP Scale	Checklist
Heading	Time to Go	Way Points	Nav. Status
Air Speed	Heading & Heading Annunciator	Navaids	Comm. Status
Altitude (BARO)	Bearing Pointers (2)	Key Elevations	System Status
Altitude (Radar)	Bearing Identifiers	Projected A/C Position	Warning/Caution Info.
Flight Director Command	Selected Heading	"Killer" Data	Departure Area Data
Flight Path Angle	Selected Course	Alternate Track	Take-off Parameters
Flight Path Acceleration	To - From	Airport/Target Location	Cruise Parameters
Drift Angle	Deviation	(Cursor Position)	Refuel Status
Vertical Velocity	Vertical Deviation Path Pointer		Air Drop Flight Parameters
Localizer & GS Deviation	Vertical Track Change Alert		Air Drop Area Data
Speed Error	Lateral Track Change Alert		Approach Data
Warnings	Offset Annunciator		Landing Area Data
Pitch Reference	Nav. Mode Annunciator		Weight and Balance Data
Sideslip	Heading Warn		(Gross Weight & Total Fuel)
Rate of Turn	Navigation Warn		Flare Inventory
Mach			SKE Display
Command Airspeed			Radar Display
Command Heading			Engine Parameters
Command Altitude			(Cursor Position)
Target Designator			
Fall Line			
Constantly Computer Impact Point			
(Cursor)			

TABLE 3.1-1 DISPLAY PARAMETERS

3.1.1.2.2.1.2 Crew Controls

The controls shown on Figures 3.1-5 and 3.1-6 are as follows:

- o Integrated Multifunction Keyboard - IMK (pilot's, co-pilot's)
- o Data Entry Keyboard - DEK (pilot's, co-pilot's)
- o Column Control Assembly - CCA (pilot's, co-pilot's)
- o Multifunction Display Controls - MFDC (pilot's HSD and MPD, co-pilot's HSD and MPD, center MPD)
- o Hand Controller Unit - HCU
- o Master Mode Keyboard - MMK

The Applications Software shall accept input from these devices, and after processing display requested information and/or acknowledge receipt of control action.

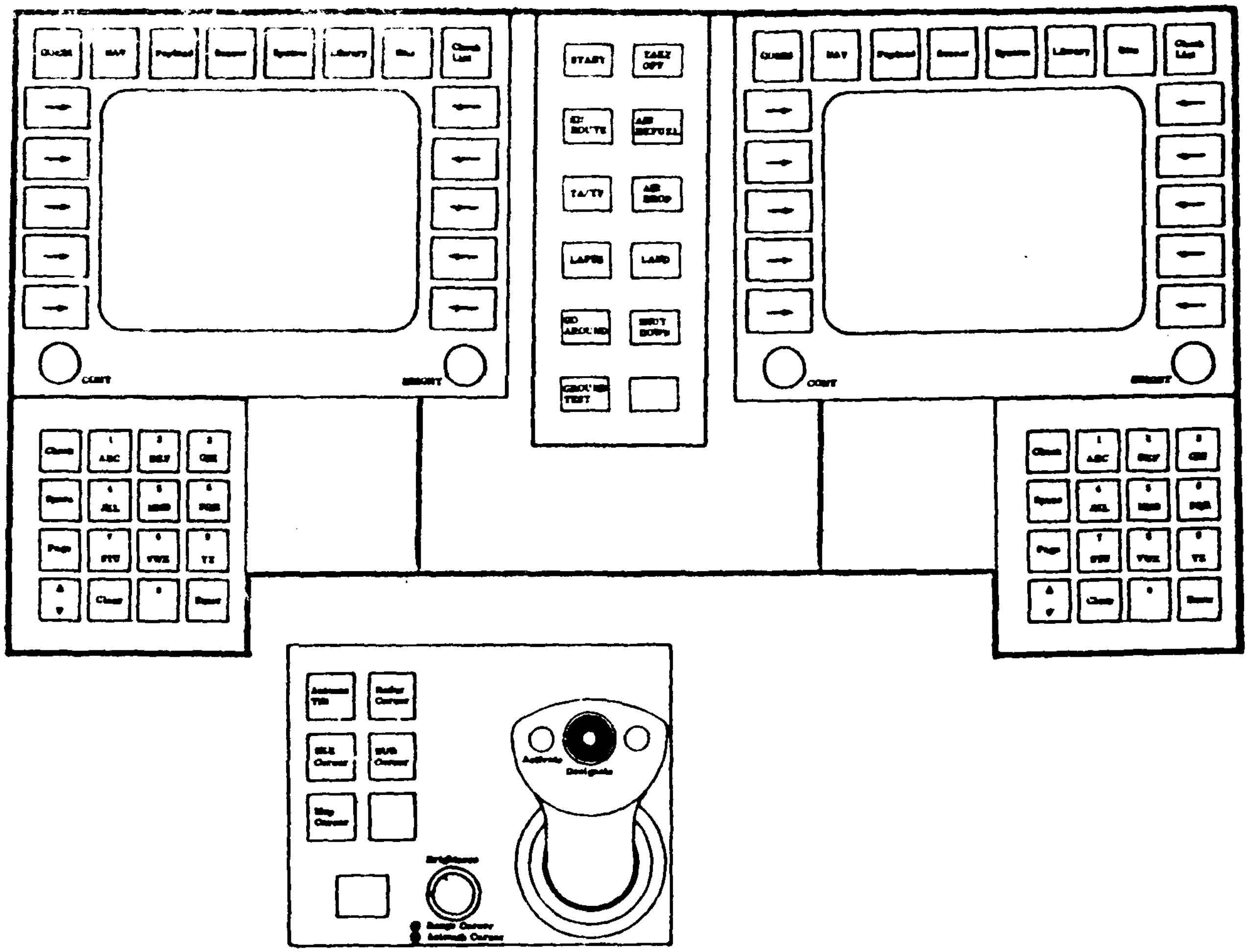


FIGURE 3.1-6 IMK-DEK-HCU

Integrated Multifunction Keyboard (IMK)

The two IMKs (pilot's and co-pilot's) are the primary crew control devices. The IMK (Figure 3.1-6) consists of two sets of keys and a CRT. There are eight keys across the top of the IMK. These top keys allow the crew to select special functions that do not normally occur during a current mission phase. These functions are:

- o Communications - used to control the radio equipment
- o Navigation - used to control the navigation equipment and steering modes.
- o Sensors - provides sensor mode control.
- o Systems - provides the crew with various system functions.
- o Library - allows the crew to activate several special function that do not fit into other functional areas.
- o Checklist - enables the crew to request MPD checklists.
- o Payload - provides control for loading and dropping of cargo.
- o DITS - provides access to test system.

The functions implied by the ten IMK side keys depend upon the current state of the IMK. Each side key has a corresponding legend on the IMK CRT which indicates the current meaning of the key. There are one or more IMK pages for each mission phase and for each special function invoked by one of the eight IMK top keys.

The eight IMK top keys are backlighted green (active) or yellow (inactive). The ten side keys are backlighted white.

The IMK CRT was discussed as a display device in Section 3.1.1.2.2.1.1.

Data Entry Keyboard (DEK)

The two DEKs (pilot's and co-pilot's) provide data entry capability and allow crew to perform MPD checklist functions.

The DEK (Figure 3.1-6) consists of 16 pushbuttons used as follows:

- o Data Entry
  - . digits 0 through 9
  - . CASE : upper/lower case
  - . ENTER : indicating end of data to software
  - . CLEAR : indicating restart to software
- o Checklist
  - . CHECK : check off item
  - . SPACE : skip item
  - . PAGE : advance page

The identification of each key depressed is sent (one at a time) to the Applications Software and shall be processed upon receipt of an ENTER.

Column Control Assembly (CCA)

The two CCAs (pilot's and co-pilot's) allow microphone control by crew members. Shaker commands to the CCAs shall be generated by the Application Software whenever a stall condition becomes imminent.

Multi-Function Display Controls (MFDC)

The MFDC consists of the six pushbuttons functionally attached to each MPD/HSD device. These pushbuttons are used by the crew to:

- o Switch a display from one device to another.
- o Request sub-types of a display.
- o Vary the display scale.
- o Request sensor video.
- o Etc.

The selected pushbutton(s) are backlighted.

Hand Controller Unit (HCU)

The HCU is used for: 1) navigation data entry and 2) radar antenna control. Figure 3.1-6 shows its layout.

HCU control consists of:

- o Seven pushbuttons allowinq selection of the CRT where cursor is applicable.
- o A hand control to move cursor.
- o A button on the hand control which activates output of cursor displacement (1st push) and terminates or designates to software the final cursor position (2nd push).

The pushbuttons are backlighted green (active) or white (inactive).

Master Mode Keyboard (MMK)

The MMK (Figure 3.1-6) allows crew members to select high-level mission modes. These modes determine the parameters to be displayed and the control capability to be offered by the Application Software. Only one Master Mode can be active at any time.

MMK pushbuttons are backlighted green (active) or yellow (inactive).

The Master Modes are:

START	Includes flight crew preflight
TAKEOFF	Taxi, takeoff, area departure
ENROUTE	Later climb, cruise, early descent
AIR REFUEL	Rendeqvous, acquisition, refuel
TF/TA	Terrain Following/Terrain Avoidance
AIR DROP	All except LAPES

LAPES	
LAND	Approach, land, taxi
GO AROUND	
SHUTDOWN	Includes flight crew post flight
GROUND TEST	Ground crew preflight and postflight

3.1.1.2.2.1.3 Flight Control System

The Flight Control System is assumed to be flight critical; therefore it was mechanized in a triplex configuration. The air data and aircraft attitude information is required for flight control and assumed to be available for use by the avionics. In addition, the avionics system shall provide steering signals to the flight control system and monitor the flight control status.

The IDAMST - Flight Control System interface is shown in Figure 3.1-7.

3.1.1.2.2.1.4 Weights and Balance

A simple weight and balance function is assumed, whereby aircraft gross weight, total fuel, and calculated center of gravity (c.g.) is displayed via an MPD. The crew must input aircraft gross weight and c.g. position prior to takeoff and decremented weight and c.g. shift after cargo drop. The mission processors will maintain current estimated gross weight and c.g. position prior to takeoff and decremented weight and c.g. shift after cargo drop. The mission processors will maintain current estimated gross weight and c.g. position throughout the flight, based upon crew inputs, remaining fuel, and fuel distribution. Cargo weight decrements and c.g. shifts may be pre-stored and only the drop event need be signalled to the processors via the IMK.

3.1.1.2.2.1.5 Fnergy Management

Engine performance and airplane operations can be optimized by energy management technique. Energy management has been noted only as a potential growth item.

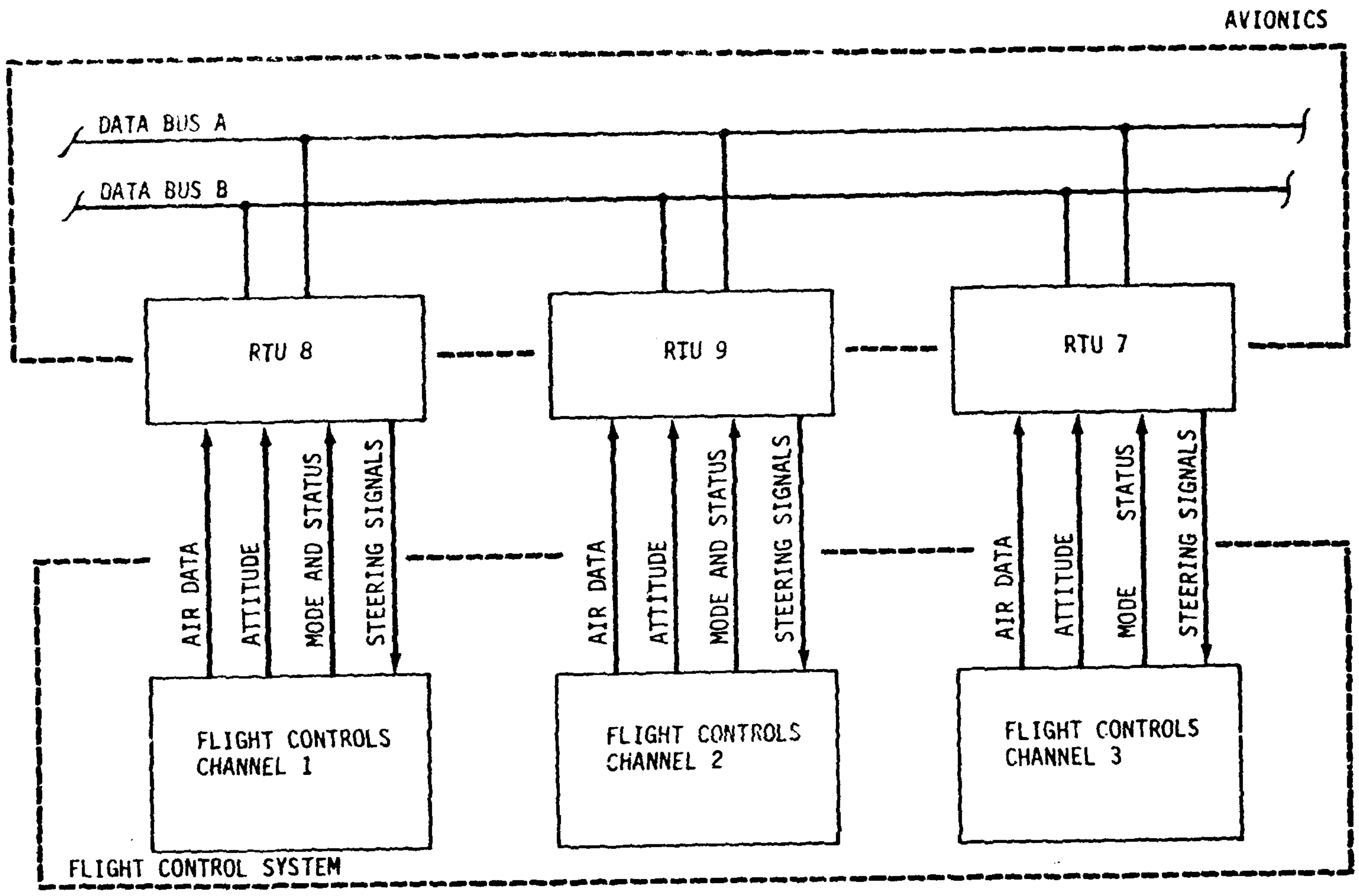


Figure 3.1-7 Avionics/Flight Control System Interface

3.1.1.2.2.2 Communications

IDAMST provides the flight crew with the capability to control various communication devices for air-ground, air-air, and internal communications. A description of the function(s) associated with each device is given below.

The Intercommunication Set (AN/AIC-18) provides:

- o two-way voice communication between crew stations
- o interfaces with radio tranceivers, navigation receivers, public address amplifier, and maintenance intercom outlets

The ICS allows for selection, control, and distribution of radio systems for airborne/ground station communication and monitoring.

The P.A. System (AN/AIC-13) is used for voice announcements in the cargo areas.

The two UHF-AM (AN/ARC-164) are used for military communications and as backup ADF receivers. They provide short-range, line-of- sight, two-way simplex voice communication with ground systems and other aircraft, operating in the 225-399.95 mHz frequency band. When the radio is in backup ADF mode, bearing is obtained via the ADF EQUIP.

The VHF-AM radio (Wilcox-807A) is used for CCT and civilian communications. It provides two-way simplex 160 nautical mile voice communication in the 118 - 135.975 mHz frequency band over line-of-site propagation paths.

The VHF-FM radio (FM622A) is used primarily for military/CCT communications. It provides short-range line-of-sight, two way simplex voice communication in the 30 - 75.95 mHz frequency range.

The HF/SSB radio (AN/ARC-123) is used for long-range military communications. It provides two-way simplex voice communications at distances up to 2,500 nautical miles, operating in the 2 - 30 mHz frequency band.

The Secure Voice System (TSEC/KY-58) encrypts and decrypts VHF/UHF voice communication.

The IFF/SIF (AN/APX-101) is used for automatic radar identification and position/altitude reporting in the civil air traffic control system and similar data in the tactical traffic control environment. Its operational frequency band is 1030 - 1090 mHz.

Control is implemented by the flight crew via IMK. The particular control associated with each device shall be as shown in Figure 3.1-8.

3.1.1.2.2.3 Navigation and Guidance

IDAMST provides an Integrated Navigation System (Figure 3.1-9) which performs the following functions:

COMMUNICATIONS CONTROL FUNCTIONS

UHF #1	UHF #2	VHF-AM	VHF-FM	IFF ON/OFF	HF/SSB	SEC VOICE ON/OFF
OFF	OFF	ON/OFF	OFF	(NOTE)	ON/OFF	(NOTE)
T/R	T/R	*FREQ SEL	T/R		SSB	
T/R+G	T/R+G	SQUELCH	RE-TRANS		AME	
ADF	ADF	DISABLE	HOME		FREQ SHIFT KEY	
GUARD XMIT	GUARD XMIT	*VOLUME	*FREQ SEL		CW	
*CHAN SEL	*CHAN SEL		SQUELCH		*FREQ SEL	
*FREQ SEL	*FREQ SEL		DISABLE		*SQUELCH	
CHAN PRESET	CHAN PRESET		CARRIER		DISABLE	
SQUELCH	SQUELCH		TONE		NOISE BLANK	
DISABLE	DISABLE		*VOLUME		RF GAIN	
*VOLUME	*VOLUME				*VOLUME	

ICS ON/OFF

(NOTE)

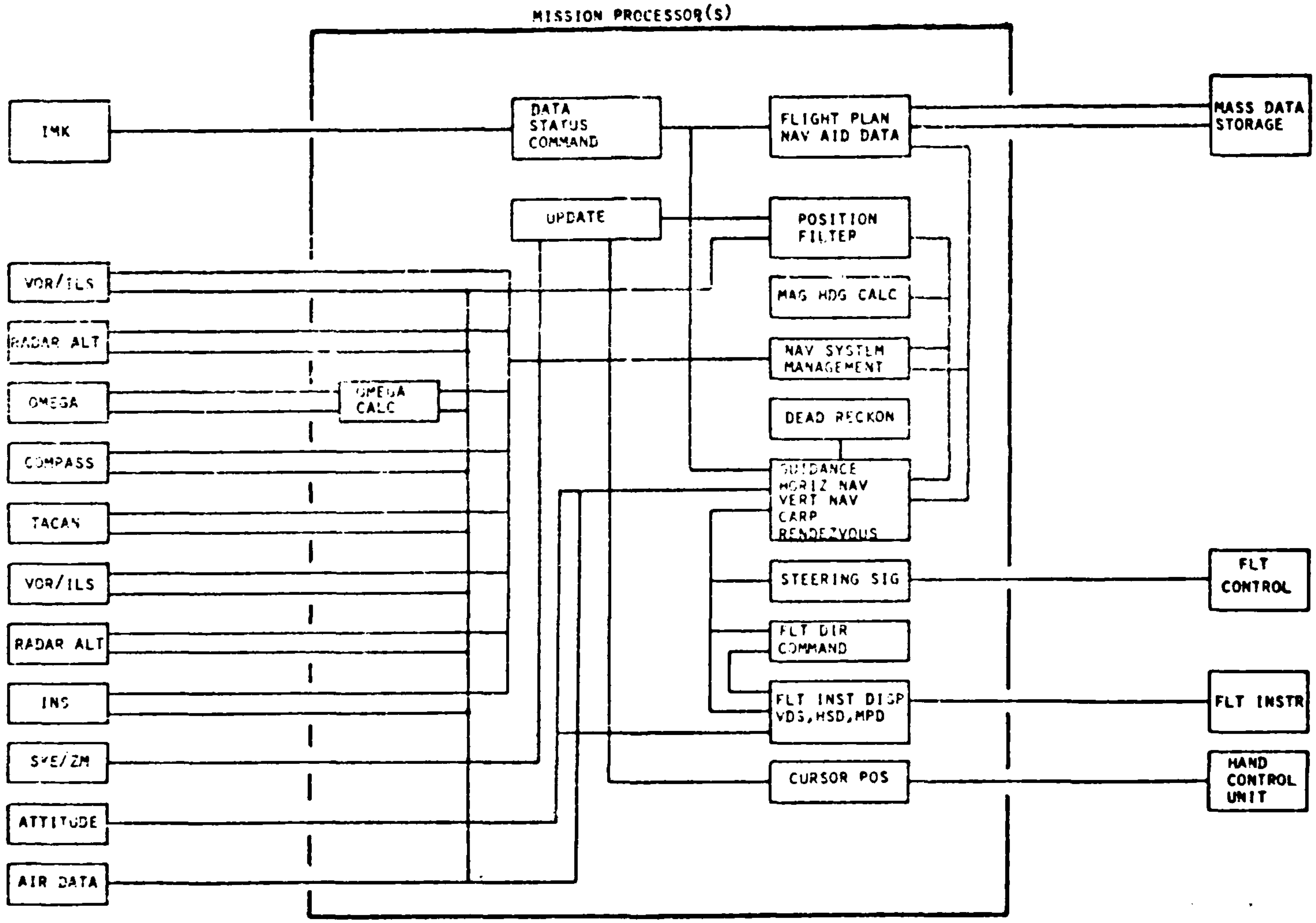
P.A. ON/OFF

(NOTE)

*DEK INPUT

NOTE: DEDICATED CONTROL PANELS FOR - IFF
- SECURE VOICE
- INTERCOMM AND PA

FIGURE 3.1-8 COMMUNICATIONS EQUIPMENT CONTROL REQUIREMENTS



INTEGRATED NAVIGATION SYSTEM

INS BLOCK DIAGRAM

FIGURE 3.1-9

Area Navigation

The following enroute and terminal navigation functions are provided:

- o Automatic three dimensional navigation and guidance within the ATC environments
- o TACAN slant range correction
- o Automatic tuning of navigation radio receivers
- o Great circle navigation and optimization of navigation position
- o Route and terminal navigation data storage capacity adaptable to Air Force requirements
- o Simple reversion to VORTAC or Inertial navigation
- o Offset track capability

Computed Air Release Point (CARP)

Automatic CARP calculation capability shall be provided. Means of entering load characteristics, wind data, relative target location, and position update capability shall be designed for pilot ease of operation.

Rendezvous

Navigation data will be processed to compute guidance and steering data to enable rendezvous with other aircraft.

Flight Director

Flight Director Command Signals are provided for display on the pilots' Altitude Director Indicator.

Steering

Steering signals are provided for the Flight Control System.

To accomplish the above functions, the following sensors are provided:

- o The TACAN System (AN/ARN-118) furnishes data relative to a selected TACAN facility operating in the 962 - 1213 mHz frequency band.
- o The two Radar Altimeters (AN/APN-194) are range tracking radars which provide altitude information from 0 - 5000 feet.
- o The OMEGA Radio Navigation System (AN/ARN-) provides airplane position fixes using the worldwide network of VLF ground transmitters.

- The Magnetic Compass (C-12) provides heading information for navigation.

- The LF/ADF (DF-206) provides the navigation calculation with bearing to a selected low frequency radio station.

- The UHF/ADF (DF-301E) provides the navigation calculation with bearing to a selected ultra-high frequency radio station.

- The INS (Carousel IV) is a self-contained inertial navigation system (including a digital computer) which provides worldwide aircraft navigation entirely independent of ground communication.

- The Instrument Landing System (AN/ARN-108) is used in conjunction with ground transmitting equipment and airplane flight director calculations to provide display capability for marker beacon, glide-slope, and localizer signals.

- The Station Keeping Equipment (AN/APN-169) is a cooperative air-to-air station keeping system for flights of up to 36 aircraft. It enables these aircraft to locate and identify one another; and to maintain formation/rendezvous regardless of visibility. The SKE interfaces with the MDSC to provide a formation display.

- The Long Range Radar (AN/APQ-122) provides precise navigation capabilities for long-range ground mapping, weather detection, and beacon interrogation. A high-resolution CRT radar display is available to the crew upon request. Data is input into the navigation function via HCU in conjunction with the CRT display.

- The Flight Control System provides air data, attitude, and mode and status information. This information is processed by the avionics system to provide steering data for the flight control system.

Sensor control is implemented by the flight crew via IMK. The particular control associated with each sensor shall be as shown in Figure 3.1-10.

3.1.1.2.2.4 Payload

IDAMST functions in this area consist of providing payload status reporting and automatic load release control.

Status

The Applications Software shall monitor, maintain and report (via CRT display) status of -

- Ramp and cargo door

- Chute release

- Caution signal

NAVIGATION CONTROL FUNCTIONS

INS
- ON-OFF
- STANDBY
- ALIGN
- NAV
- ATT
- AUTO/MANUAL
- INITIAL POSITION
- *WAY POINT LOADING
- *UPDATE

OMEGA
- ON-OFF
- AUTO/MANUAL
- INITIALIZE
- *GMT
- *DATE
- *LAT/LONG

L.R. RADAR
- MODE SELECT
  - OFF
  - STND BY
  - MAP
  - BEACON
  - WEATHER
- *FREQ SELECT
- *MAG VAR SEL
- RF POWER
- *RF GAIN
- BEAM
- AZ STABIL
- *ISO ECHO
- SCAN SEL
  - LEFT
  - OFF
  - RIGHT
  - SCATTER
  - HIGH
- *RANGE SELECT
- FAST TIME ON-OFF
- SENS TIME
- FREQ AGILE MODE ON-OFF
- HDG MKR INTENS
- RNG MKR INTENS
- SWEEP INTENS

TACAN
- ON-OFF
- AUTO/MANUAL
- *CHANNEL SELECT
- TEST X-Y
- *IDENT VOLUME
- MODE SELECT
  - REC
  - T/R
  - A/A REC
  - A/A TR
- *SELECT COURSE

COMPASS
- ON-OFF
- SLAVED
- DG
- *SET HEADING
- *SET LATITUDE

VOR/ILS/MB#1
- ON-OFF
- AUTO/MANUAL
- *FREQ SELECT

VOR/ILS/MB#2
- ON-OFF
- AUTO/MANUAL
- *FREQ SELECT

RADAR ALTM #1
- ON-OFF
- *LOW ALT SEL
- TEST

RADAR ALTM #2
- ON-OFF
- *LOW ALT SEL
- TEST

*DEK INPUT

FIGURE 3.1-10: NAVIGATION CONTROL REQUIREMENTS

NAVIGATION CONTROL FUNCTIONS

AIRDROP DATA ENTER

- *LAT/LONG
- *TYPE
- *WEIGHT
- *WIND
- *RELATIVE FIX
  - -RANGE
  - -BEARING
- *ALTITUDE

MANUAL

- AUTO
- INS
- OMEGA
- TACAN
- VOR/ILS
- FORMATION
- HDG SEL

DIRECTION FINDER

- LF-DF
  - ON-OFF
  - AUTO/MANUAL
  - *FREQ SEL
  - TEST
  - *VOLUME
- VHF-ADF
  - ON-OFF
  - AUTO/MANUAL
  - *FREQ SEL
  - TEST
  - *VOLUME

SKE (IPS)

- ON-OFF
- FREQ A/FREQ B
- *IN TRK OFFSET
- *ALT OFFSET
- *CROSS TRK OFFSET
- *LDR # SEL
- *PRX WARN RNG
- PRX WARN TONE
  - ON-OFF
- PRX WARN TONE
  - RESET
- MASTER-FOLLOW SEL
- MASTER IND
- BITE TEST
- ID FUNC SEL
- *RNG SCALE SEL
- *RNG MARK INTEN
- DISPLAY CENTERING
- BLANKING

NAV DATA DISPLAY

- RNG BRG
- OFS
- WAY POINT
- FROM-TO
- GS/GTK
- WIND
- TTG/XTK
- PP
- MON
- NAVAID DATA

NAV DATA ENTER

- *ROUTE SELECT
- *WAY POINT LOAD
- *WAY POINT SEQ
- *PRESENT POSITION
- MARK
- HOLD
- OFFSET
- **UPDATE
- *NAVAID SELECT
- AUTO/MANUAL
- ENTER

MANUAL SELECT

- *ALT SEL
- *AIRSPEED CMD
- *PITCH ATT CMD
- *FPA CMD
- *SEL CRSE
- *SEL MDA
- *SEL DH

*DEK INPUT
**HCU INPUT

FIGURE 3.1-10: NAVIGATION CONTROL REQUIREMENTS
Continued

o Jump signal

o Paratroop alarm

o Aft door deflection

Release Control

Cargo delivery control consists of a load release signal output from the CARP function.

3.1.1.2.2.5 Aircraft Systems

The IDAMST functions relating to this area include warning, caution/monitoring, electrical control, and test of the various subsystems.

Warning

IDAMST incorporates either copied or generated warning functions. Copied warning functions are monitored at the flight crew's hardwired (dedicated) indicators and their status copied into IDAMST processors. Warnings are subsequently displayed on the crew's primary flight displays and appropriate emergency checklist procedures are selected for display on the pilot's or copilot's MPD. Copied warning functions do not have responsibility for originating the warning signal. This is the responsibility of the affected system or equipment. Generated warning signals originate within the IDAMST system. Primary responsibility for detection and warning is an IDAMST responsibility.

Copied Warning functions shall be

Fire

Gear

Stabilizer Trim

Generated Warning functions:

Ground proximity warning shall be generated on the basis of aircraft altitude (above ground), vertical velocity, gear position, and flight mode. Visual and aural warnings will be commanded.

Stall warning shall be generated on the basis of flap position, angle of attack, and thrust computations in the STOL configuration. Visual readout on flight instruments and the "stick shaker" command shall be initiated by the IDAMST system.

Low Speed warning shall be generated when the computed airspeed approaches minimum airplane requirements. A visual warning will be provided.

Overspeed warning shall be generated when the computed airspeed exceeds the airplane maximum speeds (V_H/M_H). Aural warning (clacker) and visual display shall be provided.

EFCS warning shall be generated when the IDAMST processor is error status is received from the Flight Control System. Aural warning and visual display shall be provided.

Caution Monitoring

IDAMST provides secondary control for caution functions: It shall copy current status and provide (on request) an MPD procedure checklist display to assist the crew in determining the cause of the caution message. Monitored functions are derived from monitor sensors, and displays of significant parameters are provided to the crew via MPD display.

Copied Caution Functions shall consist of

Electrical System
Hydraulic System
Fuel System
Boundary Layer Control
Air Conditioning
Anti-Ice
Overhead Caution Annunciator
Brakes
EFCS

Monitored Functions shall consist of

Engine Parameters (N1, EGT, N2, FF, oil pressure and oil quantity)
Flap Position (left USB, right USB, left outboard flap, left inboard flap, right inboard flap, and right inboard flap).
Control Surfaces Position (spoiler elevator and rudder)
Avionics Systems Hardware Status

Electrical Control

Control is included in the IDAMST processor to provide automatic on/off control of the remote power controllers. Avionics power management is maintained based on the following criteria:

- Manual crew entry
- Automatic start-up
- Master mode
- Minimal power requirements for overload conditions
- Automatic reset of nuisance trips

IDAMST provides on/off control for the following:

Instruments and Aircraft Systems

- counting accelerometer
- gear-up and locked-left
- gear-up and locked-right
- weight on gear - left
- weight on gear - right
- stick shaker 1
- stick shaker 2
- stab. trim position
- flap position - left
- flap position - right
- fuel totalizer
- engine 1
- engine 2

Navigation and Guidance

- long range radar
- radar altimeter 1
- radar altimeter 2
- magnetic compass
- INS
- OMEGA
- ILS 1
- ILS 2
- LF ADF
- UHF ADF
- TACAN
- SKE

Communications

- public address
- intercommunication set
- HF/SSB radio
- VHF-AM radio
- VHF-FM radio
- UHF-AM radio 1
- UHF-AM radio 2
- IFF
- secure voice

Controls and Displays

- HUD 1
- HUD 2
- HSD 1
- HSD 2
- MPD 1
- MPD 2
- MPD 3
- MPDG 1
- MPDG 2
- DSMU
- MDSC
- MFDC
- HCU
- MMK

Defensive Measures

- IRD & W
- RH & W
- flares dispenser

Test

IDAMST shall incorporate a limited, in-flight test capability by virtue of BITE, software reasonableness test on input data or associated computed values, and correlation of sensor data by direct comparison with redundant hardware or similar hardware. The extent of in-flight testing which will be practical is TBD. Test data shall be recorded on the DITS recorder. Selected data shall also be input to the Crash Data Recorder.

3.1.1.2.2.6 Defense

The IDAMST functions in this area are those associated with threat detection, warning, display, and flare dispensing.

Infrared Detection and Warning System

The IRD & W System is a defensive countermeasure which detects heat sources. A quadrant-oriented threat display is produced automatically on an MPD upon detection. IRD & W crew control consists of on/off.

Radar Homing and Warning System

The RHAW System is a defensive countermeasure which detects radar sources. A quadrant-oriented threat display is produced automatically on an MPD upon detection. RHAW crew control consists of on/off.

Flares Dispenser System

The Flares Dispenser System contains four volleys of flares which are used as a defensive measure against infrared seeker threats. Crew control consists of on/off, and the capability to drop flare volleys in any combination, either individually or as a group. Flare status is displayed on request.

Simultaneous threat information from the IRD & W and RHAW Systems will be merged into one display.

3.1.1.2.3 Software Interfaces

The only external software interface defined for the Applications Software is with the OFP Executive Software. The Executive Software provides services for the execution of real-time applications, sharing of common data, interprocessor communication, and communication with and between remote terminal units.

Those EHARS functions relating to the Applications Software are performed by code imbedded in the Applications Software. This interface is described in detail in Reference 2.1.3.2.

3.1.1.2.3.1 Executive Software Interface

The Applications Software consists of Tasks, Comsubs, Compool Blocks, and Events.

Tasks and Comsubs are processing modules, containing executable code and local data. Compool Blocks are data modules used for communication between Tasks. Events are boolean values used for control interactions between Tasks.

Tasks interact with the Executive through Real Time Pseudo-Declarations and Real Time Pseudo-Statements.

3.1.1.2.3.1.1 Tasks

Tasks are the principal components of the Applications Software.

At any time, any Task in the system has a "state". The possible states of a Task are shown in Figure 3.1-11 . Note that not all states are mutually exclusive; thus, a Task which is "executing" is also dispatchable, active and invoked.

Immediately following system initialization, one Task, the Master Sequencer, is Invoked by the Executive, and all other Tasks are in Uninvoked state. Thereafter, Tasks can be put into Invoked state (Scheduled) or put into Uninvoked state (Cancelled) only by Real-Time Pseudo-Statements executed within other Tasks.

Immediately after being Scheduled, a Task is Inactive; however, it has the potential to become Active, depending upon its Event Condition Set. The Event Condition Set is a collection of Conditions, each of which may be either "on" or "off". Each Condition has a "desired" value. When all the conditions in the Event Condition Set have their desired values, if the Task is Inactive, the Executive will put it into Active state. A Task may have a null Event Condition Set, in which case it can only be Inactive momentarily.

Each Condition in an Event Condition Set is associated with a set of Events. When any of these Events is set <u>on</u>, the Condition is set on; when any of these Events is set <u>off</u>, the Condition is set off. One Event may be associated with more than one Condition in an Event Condition Set. In addition, one Condition may be associated with a "Minor Cycle Event". These are Executive-generated Events which are set "on" at certain specified times and are otherwise inaccessible to the Application Software. If a Condition is associated with a Minor Cycle Event, it may not be associated with any other Event.

A Condition may be either Latched or Unlatched. A Condition associated with a Minor Cycle Event must be Unlatched. The sole difference between a Latched and an Unlatched Condition is that upon the Scheduling or Activation of a Task, the Unlatched Conditions are set to the undesired value. Thus, a Task can only be Activated by an Unlatched Condition when the value of that condition is changed to the desired value subsequent to the last Scheduling or Activation of the Task. By contrast, Latched Conditions are changed only

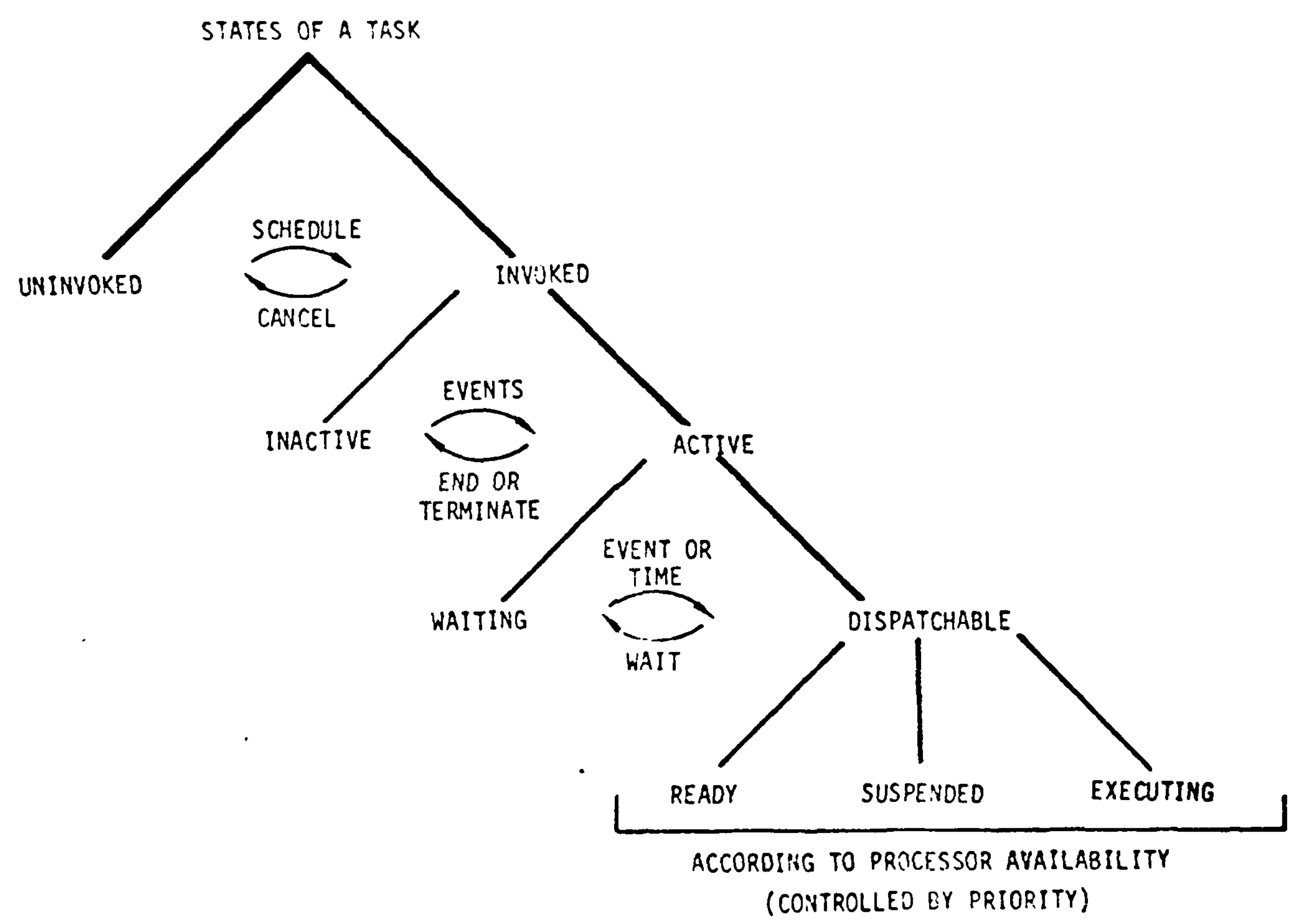


Figure 3.1-11 Task States and Control

when one of their associated Events is changed. Therefore, a Task with only Latched Conditions in its Condition Set will be immediately Activated after it is Scheduled if all the Conditions were satisfied before the Schedule Statement.

A Task may return from Active to Inactive state from twc causes: either because it completes execution, or because it is forcibly Terminated by another Task. In either case, immediately after it returns to Inactive state, the Event Condition Set is evaluated, and if all the Conditions have their desired values, the Task is immediately re-Activated.

When a Task is Activated, it is immediately put into Dispatchable state. If, at any point during its execution, a Task executes a Wait Statement, the Executive will place it into Wait state until the specified condition is satisfied, upon which the Task will again become Dispatchable.

All Dispatchable Tasks should theoretically be executed immediately. However, since there may be more than one Dispatchable Task at any time within any one of the Processors, Tasks are ordered by Priority to resolve possible conflicts. Whenever the Executive in any Processor is not called upon for immediate action, it selects the highest Priority Dispatchable Task, and causes the Processor to execute it.

If a Task is Active but has not yet been executed, it is said to be Ready. If it has been in the process of execution, but has been interrupted by a higher priority Task, it is said to be Suspended. If it is executing, it is said to be Executing.

Any given Task may only be Scheduled by one Task, which is called its Controller. Two Tasks with a common Controller are said to be "siblings". The Tasks Scheduled by any Task are said to be its "sons". If a Task has no sons, it is said to have no "descendents:" otherwise, its descendents are its sons and all the descendents of its sons.

Only a Task's Controller may Cancel or Terminate it; however, when a Task is Cancelled or Terminated, all of its descendents are Cancelled or Terminated. If a Task attempts to Cancel or Terminate itself, it will Cancel or Terminate all of its descendents, but will leave its own state unchanged.

3.1.1.2.3.1.2 Comsubs

In addition to Tasks, the Applications Software may include another kind of processing module, known as the "Comsub". A Comsub may be called from many Tasks; there is a copy of each Comsub in any processor containing a Task from which the Comsub may be called.

A Comsub communicates with a Task which calls it only through its parameters and/or function result. No Comsub may execute any Real-Time Pseudo-Statements; however, one Comsub may call another.

When a Task calls a Comsub, the Task is considered to be executing within the code of the Comsub. Thus, it is possible for one Task to be suspended within the code of a Comsub at the same time that another Task is executing within the same Comsub. In other words, A Comsub must be re-entrant. To implement this, every Task has a Comsub Local Storage Area assigned by PALEFAC for storage of local data by the Comsubs which it calls. At any time, there is a Comsub Stack Pointer which points to the area available for storage to the next called Comsub. This Comsub Stack Pointer is considered to be part of the process state of the Task, and is saved upon the occurrence of an Interrupt.

3.1.1.2.3.1.3 Compool Blocks

All communication of data between Tasks or between Tasks and the external environment (RT's) is done by means of "Compool Blocks".

Conceptually, a Compool Block is a Block existing outside of any Task. No Task may directly access a Compool Block when a GLOBAL Copy is declared; instead, a Task references a "Local Copy" which has size and attributes identical to the Compool Block. A Task may copy the Compool Block into its Local Copy by a READ Statement, or copy the Local Copy into the Compool Block by a WRITE or TRIGGER statement. From the point of view of the Application Software, READs, WRITEs, and TRIGGERs occur instantaneously, so a Compool Block can never be read when it has been partially updated by a WRITE. If a Global Copy has been declared, then the task in which the Compool is declared Global Copy is allowed to access the Global Data Block directly, rather than using Executive Read and Write Requests into and out of local copies of Global data blocks. The Executive Read and Write Requests will not actually move the data if the requesting task has declared the Global Data Block as a GLOBAL'COPY rather than as a LOCAL'COPY. The GLOBAL'COPY provides for the same central control of table formats as the LOCAL'COPY does.

Compool Blocks are divided into three classes: Input, Output, and Intertask. Input Compool Blocks can only be accessed by Tasks in a READ statement. Their values are determined by RT's. Output Compool Blocks can only be accessed by Tasks in a WRITE or TRIGGER statement; their values are "received" only by RT's. Intertask Compool Blocks are used solely for communication between tasks.

Since a Compool Block may be accessed in more than one processor and also, possibly, in an RT, Compool Blocks may exist in multiple copies. Any processor in which a Compool Block is read has a Physical Copy of the Block; any RT which references the Block, or any processor which only WRITEs or TRIGGERs the Compool Block, is considered to have a Virtual Copy of the Block. To maintain consistency between the various copies of a Compool Block, the Executive must send Compool Update Messages across the Data Bus. Compool Blocks are further classified according to when these Update Messages are sent as: Synchronous, Asynchronous, and Critically Timed.

Synchronous Compool Blocks are updated from a single authoritative Copy, whether in a processor or an RT, at a specified rate and phase. All copies of an Asynchronous Compool Block are updated when any of those copies are changed, either by the hardware of an RT or by a WRITE statement within a processor. Critically Timed Compool Blocks are a special category used only for Output. They may only be TRIGGERed within a Task. A TRIGGER statement includes a "time to go". The Master Executive sends the Update to the appropriate RT at the specified time.

The various categories of Compool Blocks are shown in Table 3.1-2, along with the ways which they may be referenced in a Task.

The first word of each Physical Copy of a Compool Block is a "Minor Cycle Time Tag" which indicates the last time the Physical Copy was updated.

3.1.1.2.3.1.4 Events

Events are used for control communication between Tasks. An Event has two possible values: on and off. A Task may READ the value of an Event, may WAIT on an Event, and an Event may appear in the Event Condition Set of a Task.

There are two general classes of Events: Application Events and System Events. Application Events are set on and off explicitly by Tasks. System Events are set on and off by the Executive upon certain occurrences. The initial value of all events is off.

System Events are further classified as:

- o Task Activation Events,
- o Compool Update Events,
- o Minor Cycle Events.

Any Task may have an associated Task Activation Event. Such an Event is set on when the Task is Activated and set off when the Task returns to Inactive or Uninvoked state. The Activation Event associated with a Task must have the same name as the Task.

Any Compool Block may have an associated Compool Update Event. Such an Event is set on when the Compool Block is updated, either by a Task or an RT. The Update Event associated with a Compool Block must have the same name as the Compool Block.

Minor Cycle Events are set on by the Executive according to specified rates and phases. They may only be referenced in Event Condition Sets.

3.1.1.2.3.1.5 Time

The Application Software may interact with time in two ways: it may reference absolute time, or it may specify that certain occurrences should happen cyclically. Absolute time is measured in seconds from the initialization of the system. Cyclic time is maintained in terms of Minor Cycles and Major Frames.

A Minor Cycle is the shortest period of time at which a cyclic occurrence may be specified. A Major Frame is the longest period of time at which a cyclic occurrence may be specified. There are a fixed number of Minor Cycles to a Major Frame (currently 64), and each Major Frame has a fixed duration (currently one second). Every Minor Cycle is numbered in order of its occurrence within a Major Frame, starting with zero.

	SYNCHRONOUS	ASYNCHRONOUS	CRITICALLY TIMED
INPUT	May be READ in in many Tasks	May be READ in one Task	
OUTPUT	May be written in one Task.	May be written in many Tasks.	May be triggered in in many Tasks.
INTERTASK	May be written in one Task, read in many Tasks.	May be written in many Tasks, read in many Tasks.	

Table 3.1-2 Categories of Compool Blocks

Cyclic occurrences are specified by period and phase. Period is the number of Minor Cycles between successive occurrences; phase is the Minor Cycle number of the first occurrence within any Major Frame. Clearly, 0 phase period.

In practice, Minor Cycles will not always occur exactly when they theoretically should, partly because of the inherent latency of a federated system; partly because the Data Bus may be overloaded in any given Minor Cycle. However, the Executive guarantees that these errors are not cumulative; it will always generate the next Minor Cycle as close as possible to the theoretical time, regardless of when the previous Minor Cycle occurred.

With one exception, the Minor Cycle is the finest granularity of time knowable with the system. Thus, when a Task reads the absolute time, it receives the theoretical time of the last Minor Cycle. The sole exception to this rule is the Critically Timed Compool Block. When a Task TRIGGERs such a Compool Block, the Executive will attempt to send the Update Message to the RT at the precise time specified.

3.1.1.2.3.1.6 Real Time Pseudo-Declarations

Real Time Pseudo-Declarations are used to declare the real time entities referred to within a Task. There are four kinds of Real Time Pseudo-Declarations:

- o Task Declarations,
- o Event Declarations,
- o Compool Block Declarations,
- o Comsub Declarations.

Task Declarations are used to declare Tasks referred to in Real Time Pseudo-Statements. They create a reference to the Task Table A entry for the appropriate Task.

Event Declarations are used to declare Events referred to in Real Time Pseudo-Statements. They create a reference to the Event Table entry for the appropriate Event. If the Event is a Compool Update or Task Activation Event, it must be declared as such in this Declaration.

Compool Block Declarations are used to declare any Compool Blocks referenced in READ, WRITE, or TRIGGER statements. They do two things:

- o They create a reference to the Data Descriptor Block for the Compool Block,
- o They access the Compool within which the Compool Block is declared, and from it create a declaration for the Local Copy of the Compool Block.

A Compool Block Declaration must indicate whether a Compool Block is read, written updated (both read and written) or triggered within the Task.

Comsub Declarations are used to declare Comsubs called within the Task. They simply generate the appropriate REF PROC declaration.

3.1.1.2.3.1.7 Real Time Pseudo-Statements

The Applications Software requests the services of the Executive through Real Time Pseudo-Statements. There are 8 kinds of Real Time Pseudo-Statements:

- o Schedule Statements
- o Cancel Statements
- o Terminate Statements
- o Wait Statements
- o Signal Statements
- o Read Statements
- o Write Statements
- o Trigger Statements
- o EREAD
- o INVOKED
- o TIME

Real Time Pseudo-Statements compile as calls to Executive routines, passing the appropriate information as parameters.

<u>Schedule Statements</u>

Schedule Statements are used by one Task to Schedule another Task. A Schedule Statement includes the following information:

- o The name of the Scheduled Task,
- o The priority of the Scheduled Task,
- o The Latched Conditions (if any) in the Event Condition Set of the Task.
- o The Unlatched Conditions (if any) in the Event Condition Set of the Task.
- o The period and phase of a Minor Cycle Event (if any) in the Event Condition Set of the Task.

The Latched and Unlatched parts of the Condition Sets are defined by event expressions . The syntax for event expression is:

<event expression>::=<condition>|<condition> AND <event expression>

<condition>::=<event set>|NOT <event set>

<event set>::=<event>|(<or set>)

<or set>::=<event>|<event> OR <or set>

Each condition in this expression corresponds to a Condition in the Event Condition Set. The presence of a NOT indicates that the desired value is <u>off</u>; the absence indicates that the desired value is <u>on</u>. The Events named in the event set are the Events associated with the Condition. Note that although multiple Events associated with a single condition are combined with ORs, the actual value of the Condition is not necessarily the OR of the value of the Events. Thus, for instance, the Condition denoted by (A OR B) will be set off if Event A is set off, regardless of the value of Event B.

<u>Cancel Statements</u>

The Cancel Statement is used by one Task to put another Task into Uninvoked state. The Cancel Statement includes the name of the Task to be Cancelled. This Task must either be the Task within which the Statement is executed, of a son of that Task. If a son is cancelled, all the descendents of the son are also cancelled automatically. If a Task attempts to Cancel itself, it will not affect its own state, but will Cancel all of its descendents. If a Task specifies itself in a Cancel Statement, it must be declared in a Task Declaration within itself.

<u>Terminate Statements</u>

The Terminate Statement functions identically to the Cancel Statement, except that it de-Activates instead of de-Invoking Tasks. When the event condition set for the terminated task becomes true, the Task will become dispatchable.

<u>Wait Statements</u>

Wait Statements are used by Tasks to place themselves into Wait State pending certain occurrences. There are four kinds of Wait statements:

- o Absolute Time Waits,
- o Relative Time Waits,
- o Latched Waits,
- o Unlatched Waits.

An Absolute Time Wait places the Task into Wait state until a specified absolute time. If the specified time has already occurred, this statement is a No-Op.

A Relative Time Wait places the Task into Wait state for a specified period of time. If the specified period is non-positive, this statement is a No-Op.

A Latched Wait places the Task into Wait state until a specified Event reaches a specified "desired value". If the Event already has the desired value, this statement is a No-Op.

An Unlatched Wait places the Task into Wait state until the specified Event is changed to the specified value. This statement is never a No-Op.

Signal Statement

A Signal Statement sets a specified Event to a specified value.

Read Statement

A Read Statement copies the value of a specified Compool Block into the corresponding Local Copy. If the Compool Block is a Global Copy, then no data transfer occurs.

Write Statement

A Write Statement copies the corresponding Local Copy into the specified Compool Block. If the Compool Block is a Global Copy, then no data transfer occurs.

Trigger Statement

A Trigger Statement requests the Executive to send the Local Copy of the specified Compool Block to the appropriate RT in a specified time. The specified time must be between two Minor Cycles and one Major Frame from the time the Trigger Statement is executed.

EREAD

EREAD yields the value of the Event which has been passed as an argument. This Event must have been previously declared in an Event Declaration.

INVOKED

INVOKED is applied to a Task. This function yields the value TRUE if the task is Invoked, FALSE if it is not.

TIME

TIME returns the absolute time as a 31 bit signed integer signifying the elapsed time since system initialization.

3.1.1.2.3.1.8 Master Executive Interfaces

Master Sequencer Interface

At the end of Master Initialization or Master Re-Initialization, the Master Executive schedules the Master Sequencer task. This task then schedules the other Applications Tasks.

Application System Error Interface

Applications Software can detect error conditions and communicate the conditions to the Subsystem Status Monitor. The primary source of errors will be the Equips functions. These functions will determine any errant status with equipment and sensors and communicate the errors to the Subsystem Status Monitor.

The Subsystem Status Monitor records the error and gathers error statistics. If the last error was within too short a time or there were too many such errors, the Subsystem Status Monitor invokes the Configurator. The Configurator will cancel errant functions if appropriate. If the errors are of such a magnitude to warrant reconfiguration, the Configurator can invoke the Reconfiguration function via the IO device function.

3.1.2 Applications Software Architecture

3.1.2.1 Software Structure

The Applications Software is organized into:

- System Control Modules
- Operational Sequencers (OPSs)
- Specialist Functions (SPECs)
- Display Processes (DISPs)
- Equipment Processes (EQUIPs)

as shown in Figure 3.1-12 . A brief functional description of each is given below.

<u>System Control Modules</u>

The four System Control Modules (Master Sequencer, Request Processor, Configurator, Subsystem Status Monitor) are responsible for initializing and controlling the Applications Software.

The Master Sequencer, the first Application's Software task activated by the Executive Software, performs data initialization and schedules the other System Control Modules. Its control interfaces are shown in Figure 3.1-13.

The Request Processor receives and interprets control panel input requests. It will activate appropriate software tasks to handle legal requests; illegal requests are ignored. Request Processor control interfaces are shown in Figure 3.1-14.

The Configurator controls the operation of application tasks. It is activated whenever a new Operational Sequencer or Brute Force Specialist Function is to be initiated, or when a severe equipment health problem is detected. Configurator control interfaces are shown in Figure 3.1-15.

The Subsystem Status Monitor maintains status of the avionics subsystems. If a subsystem has failed or is generating degraded data, it determines the type and severity of the problem, and activates the configurator if the severity is significantly high. The Subsystem Status Monitor control interface is shown in Figure 3.1-16.

<u>Operational Sequencers</u>

Operational Sequencers are responsible for the control of a particular mission phase. They are activated by the Configurator as a result of master mode selections, and by the current Handler Specialist Function whenever a new display page is requested. Operational Sequencer interface control is shown in Figure 3.1-17.

<u>Specialist Functions</u>

Specialist Functions carry out computational and control functions required by an OPS or by the crew. The four categories are Computational, Brute Force, Tailored Mode, and Handler.

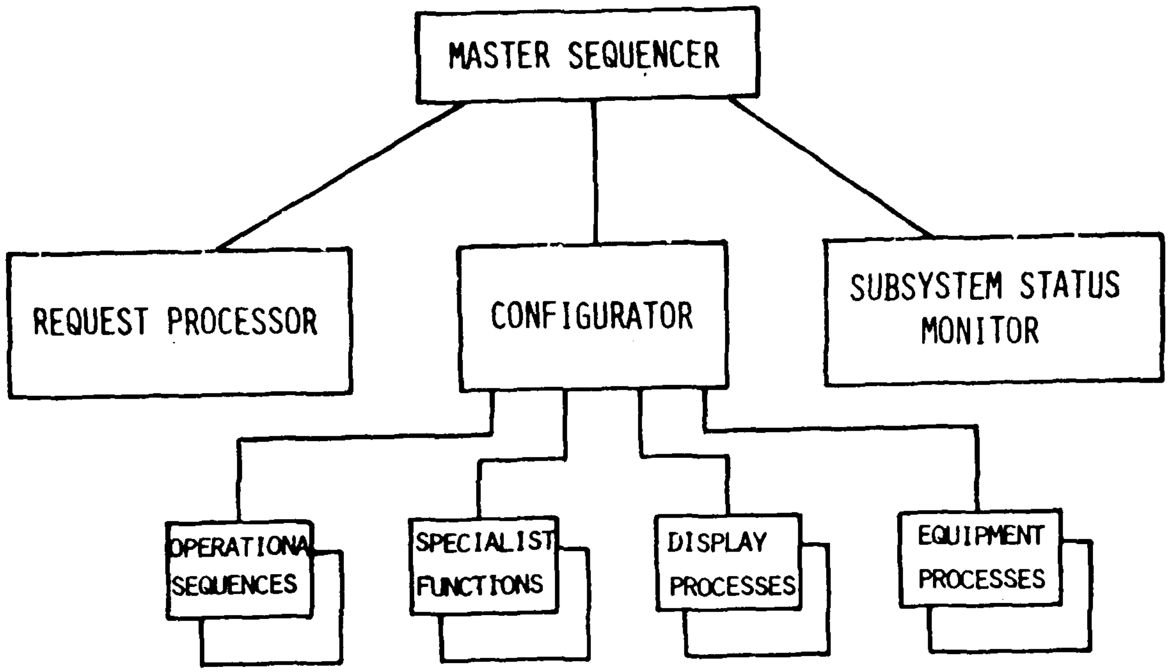


FIGURE 3.1-12 APPLICATIONS SOFTWARE ORGANIZATION

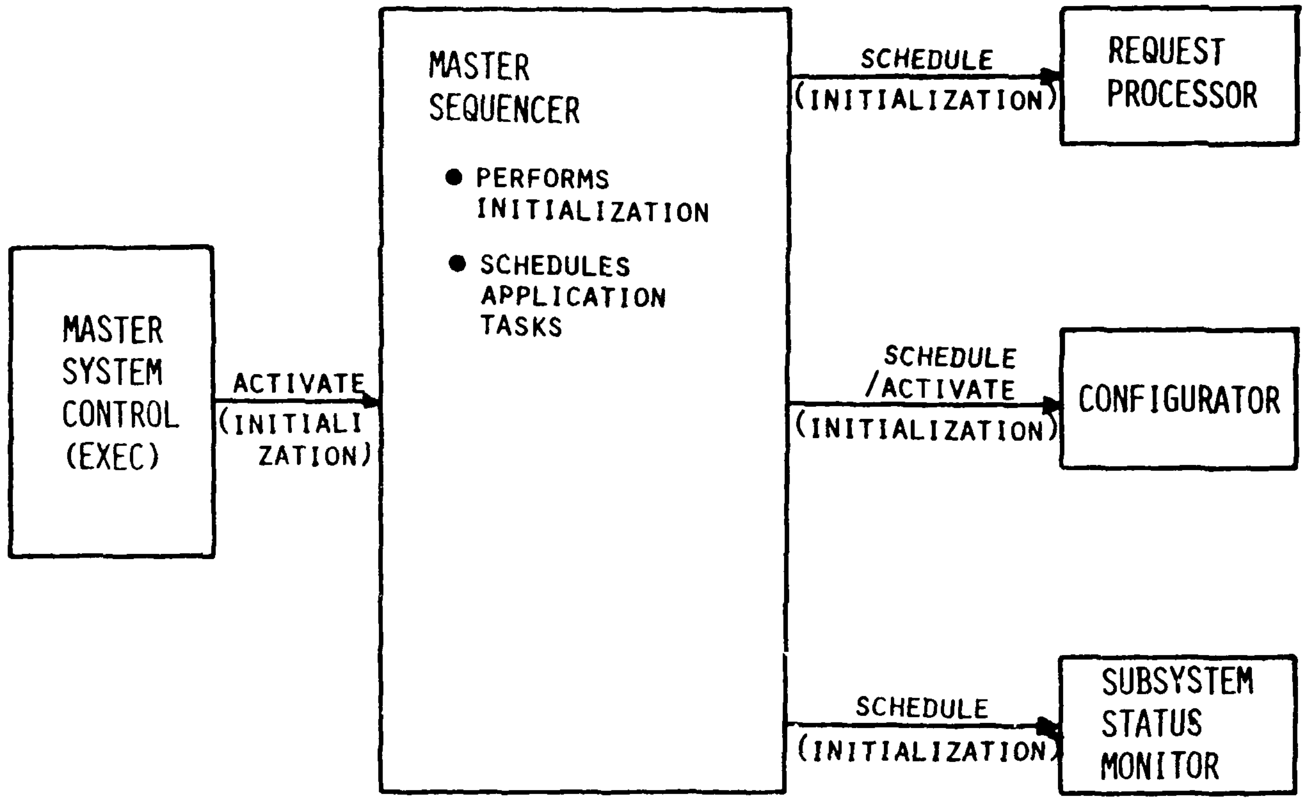


FIGURE 3.1-13 MASTER SEQUENCER INTERFACE

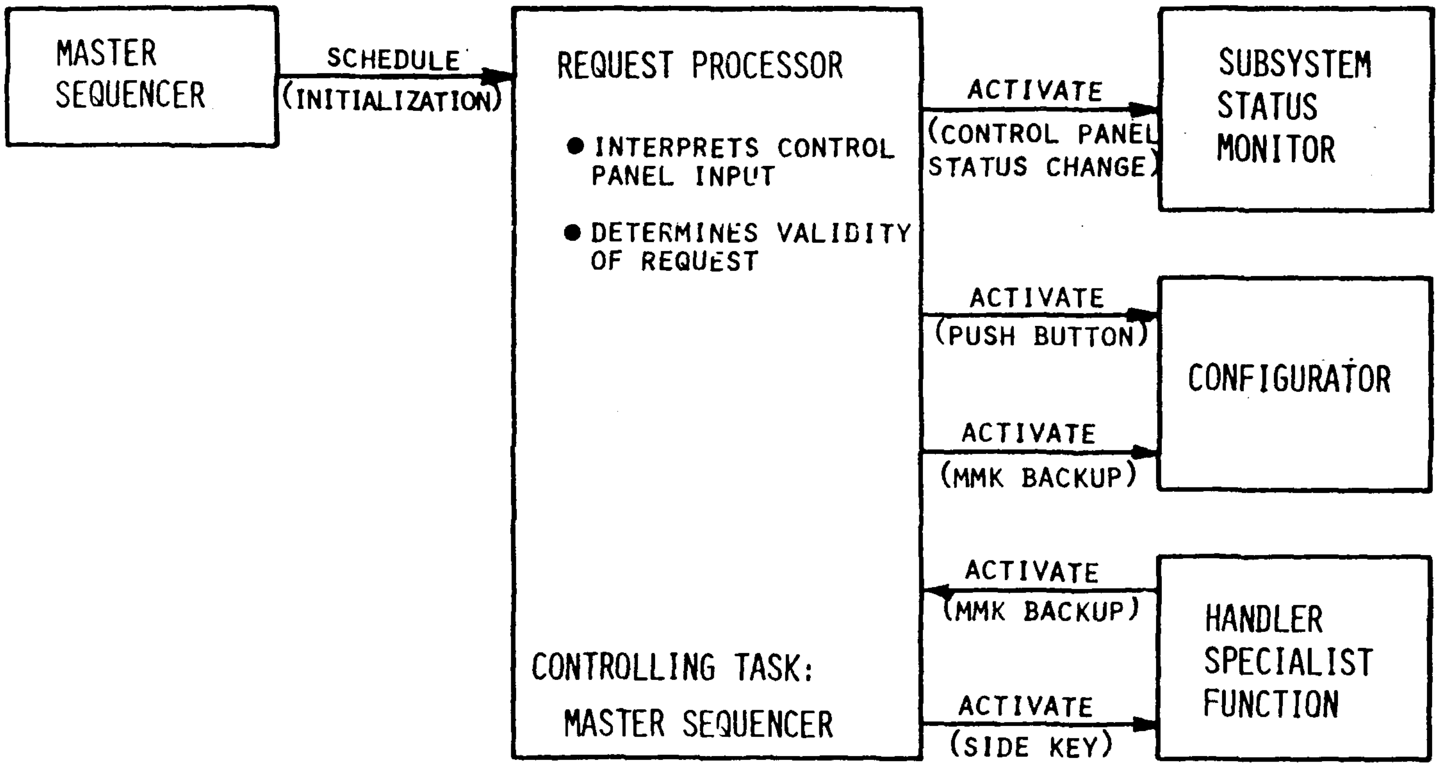


FIGURE 3.1-14 REQUEST PROCESSOR INTERFACE

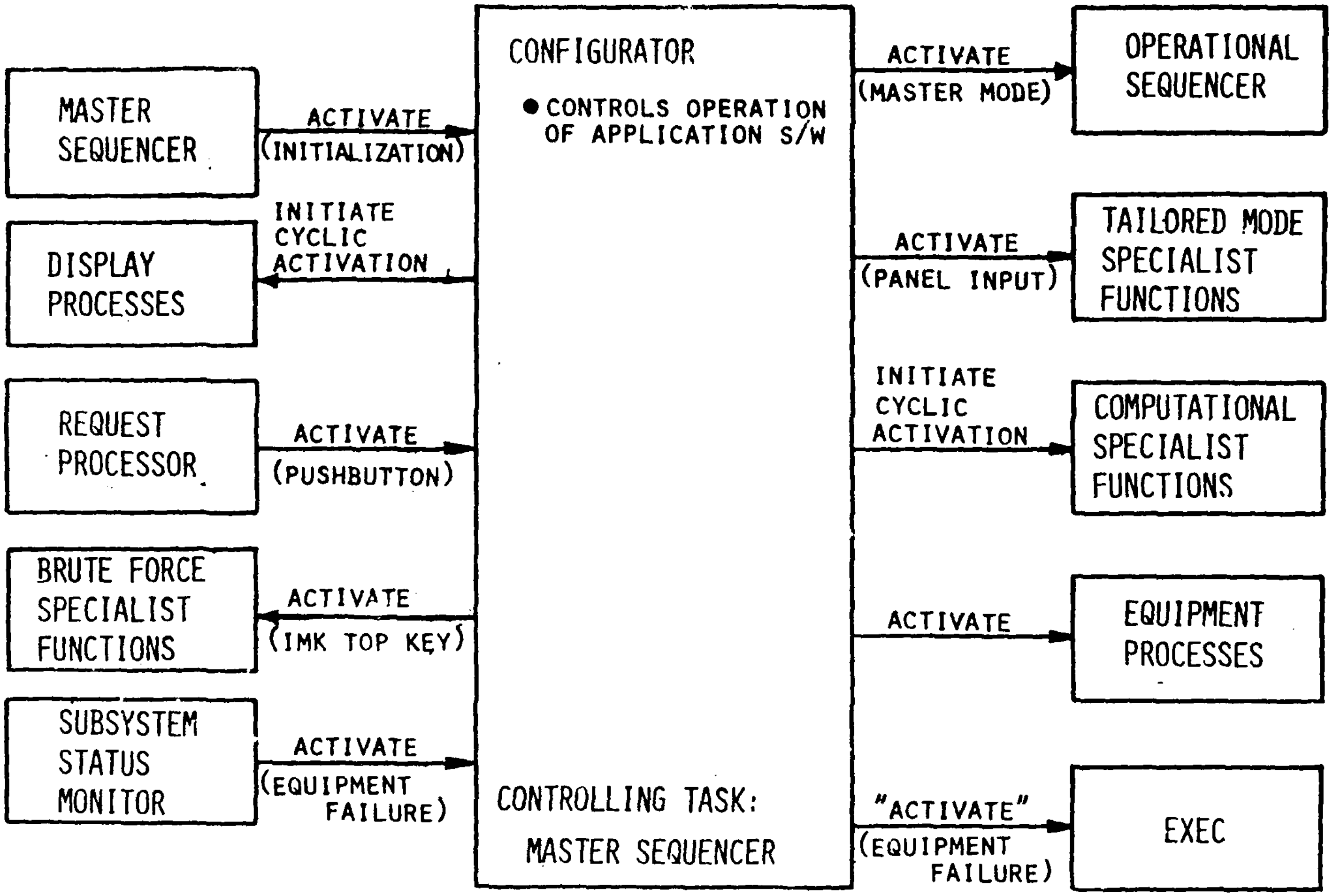


FIGURE 3.1-15 CONFIGURATOR INTERFACE

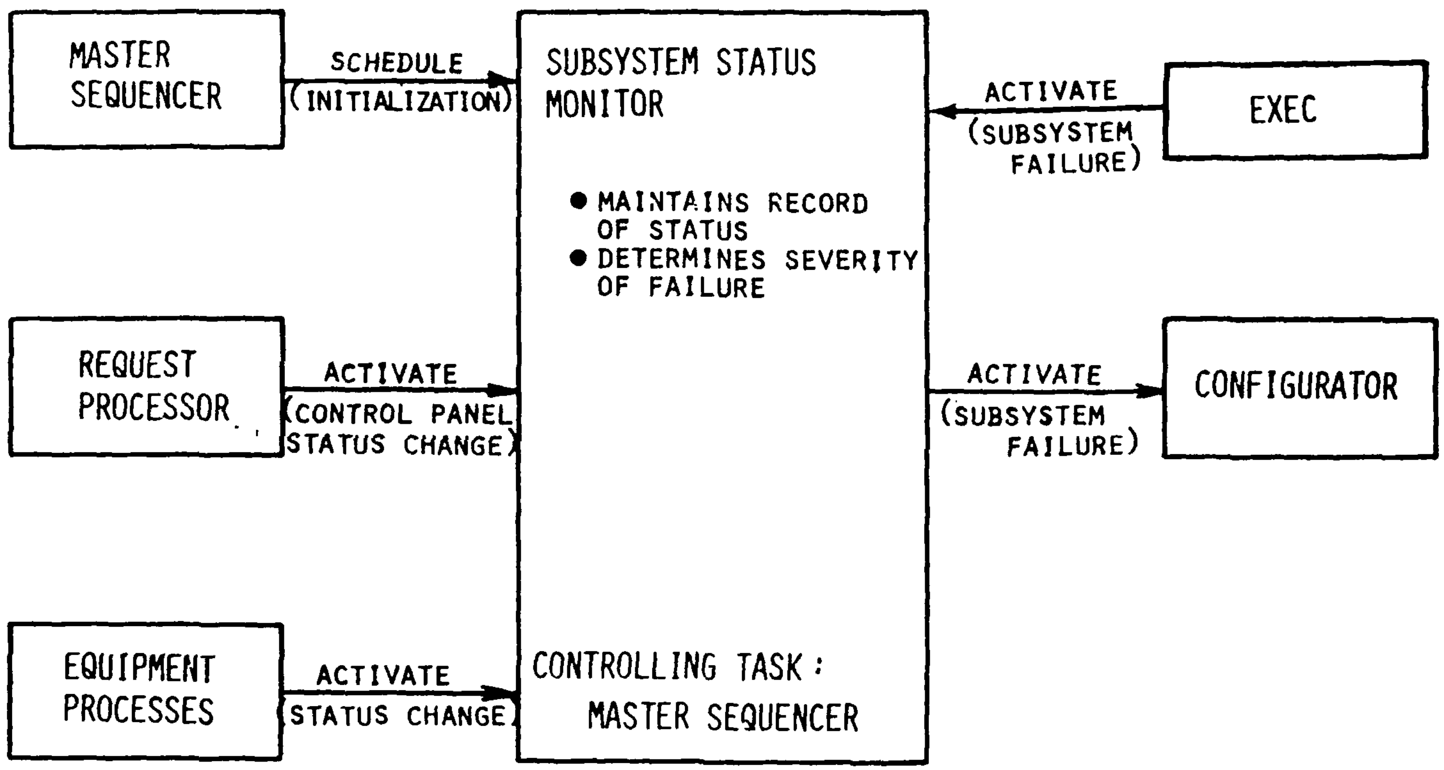


FIGURE 3.1-16 SUBSYSTEM STATUS MONITOR INTERFACE

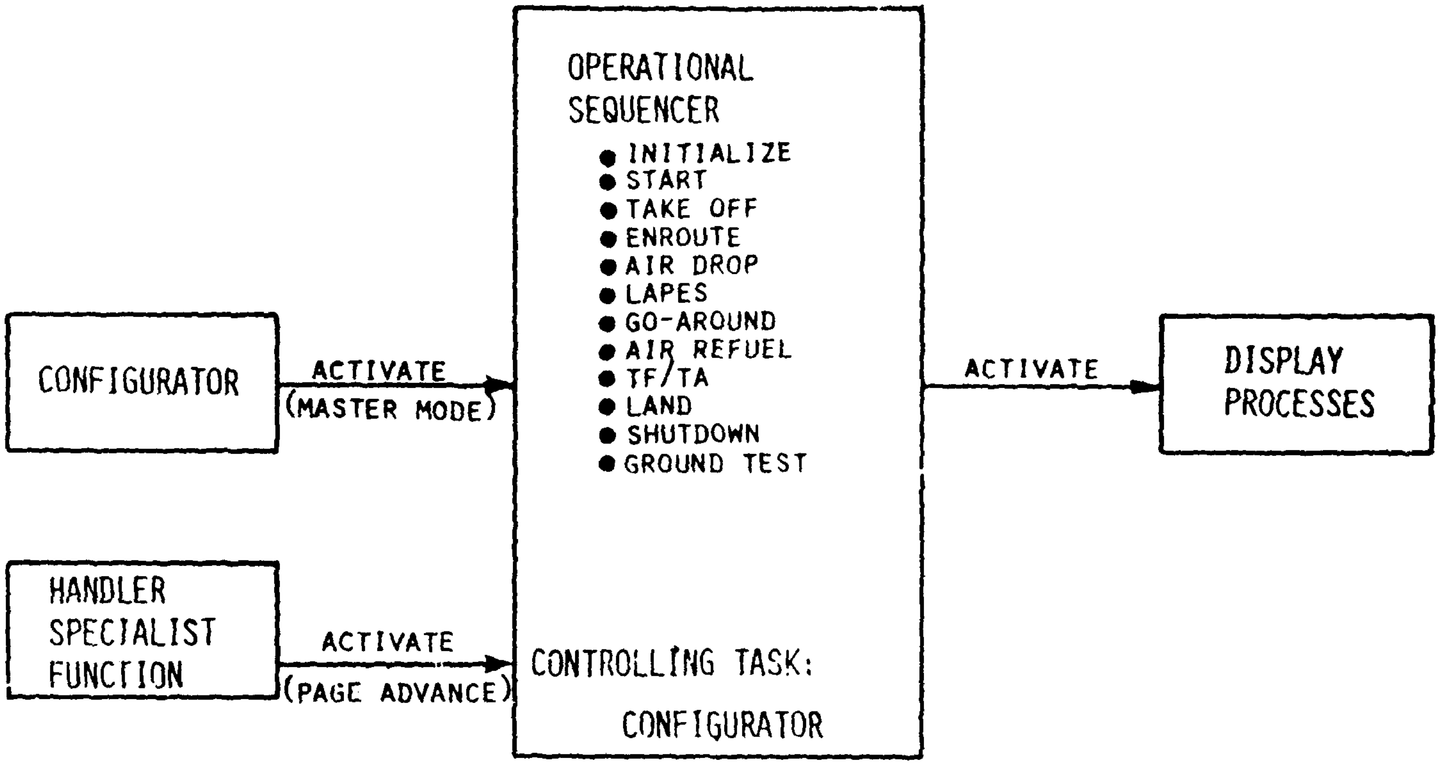


FIGURE 3.1-17 OPERATIONAL SEQUENCER INTERFACE

Computational Specialist Functions carry out cyclic processing and are usually active throughout most of the mission (e.g., navigation). Computational SPEC interface control is shown in Figure 3.1-18.

Brute Force Specialist Functions allow the pilot to initiate, sequence, and terminate mission operations that are not automatically available in the current OPS (e.g., sensor moding). They are accessed via the top keys on the IMK. Brute Force SPEC interface control is shown in Figure 3.1-19.

Tailored Mode Specialist Functions primarily perform those functions necessary to process selections by the crew via control devices (IMK, MFDC, HCU, CCA). They are activated by the current Handler Specialist Function to process IMK/DEK inputs, and by the Configurator to process other control requests. Tailored Mode SPEC interface control is shown in Figure 3.1-20.

Handler Specialist Functions perform the control processing involved with display pages. There is a Handler SPEC for each device: IMK, MPD. Handler SPEC interface control is shown in Figure 3.1-21.

Display Processes

Display Processes control cockpit displays. They obtain data generated by various Application Software tasks, perform required scaling/formatting, and output the resulting data messages to compools for subsequent transmission to display hardware. Interface control for Display Processes is shown in Figure 3.1-22.

Equipment Processes

Equipment Processes represent the Applications Software interface with IDAMST sensors.

Input Equipment Processes receive data generated by the sensors, perform required selection scaling, etc., and output the resulting parameters to a compool for use by other Applications Software tasks. They also monitor equipment status and initiate action when failure or degraded data is detected.

Output Equipment Processes receive data generated by various Application Software tasks, format corresponding sensor data/control messages, and output these messages to a compool for subsequent transfer to the sensor.

Interface control for Equipment Processes is shown in Figure 3.1-23.

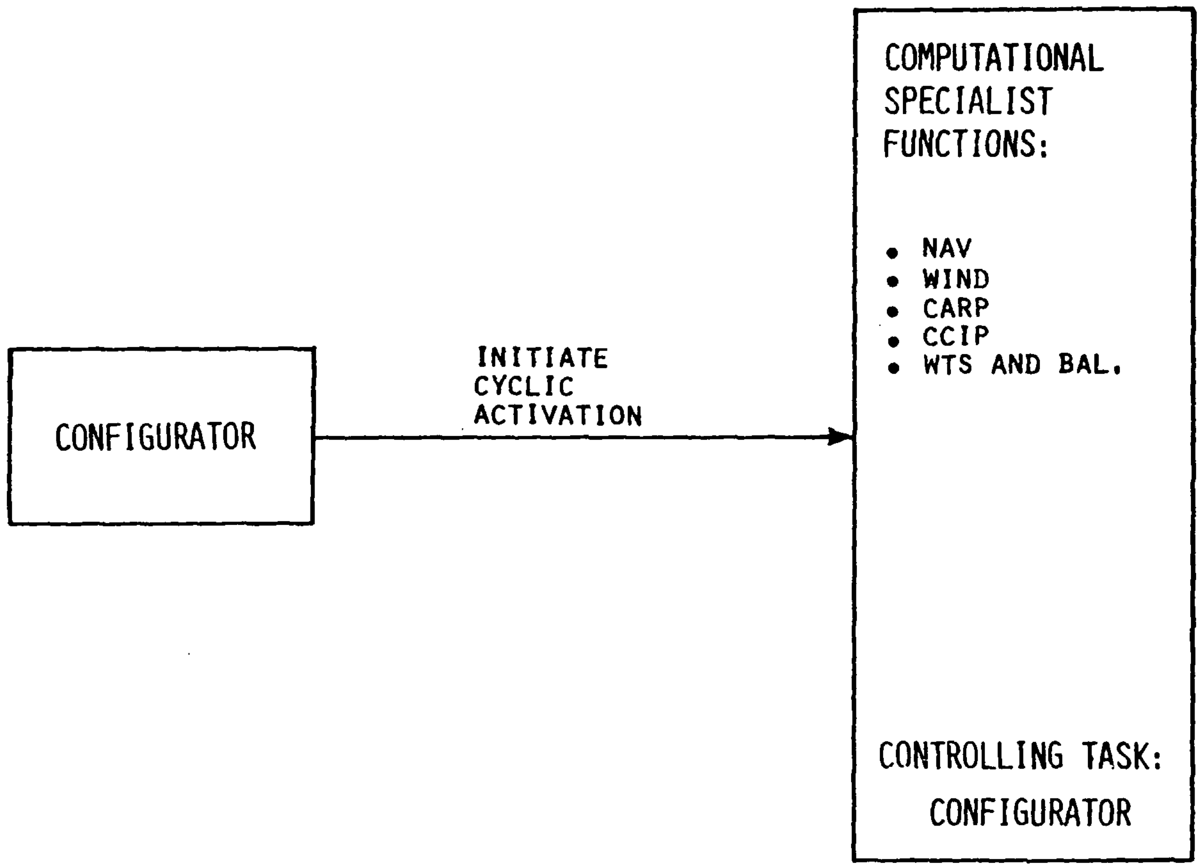


FIGURE 3.1-18 COMPUTATIONAL SPEC INTERFACE

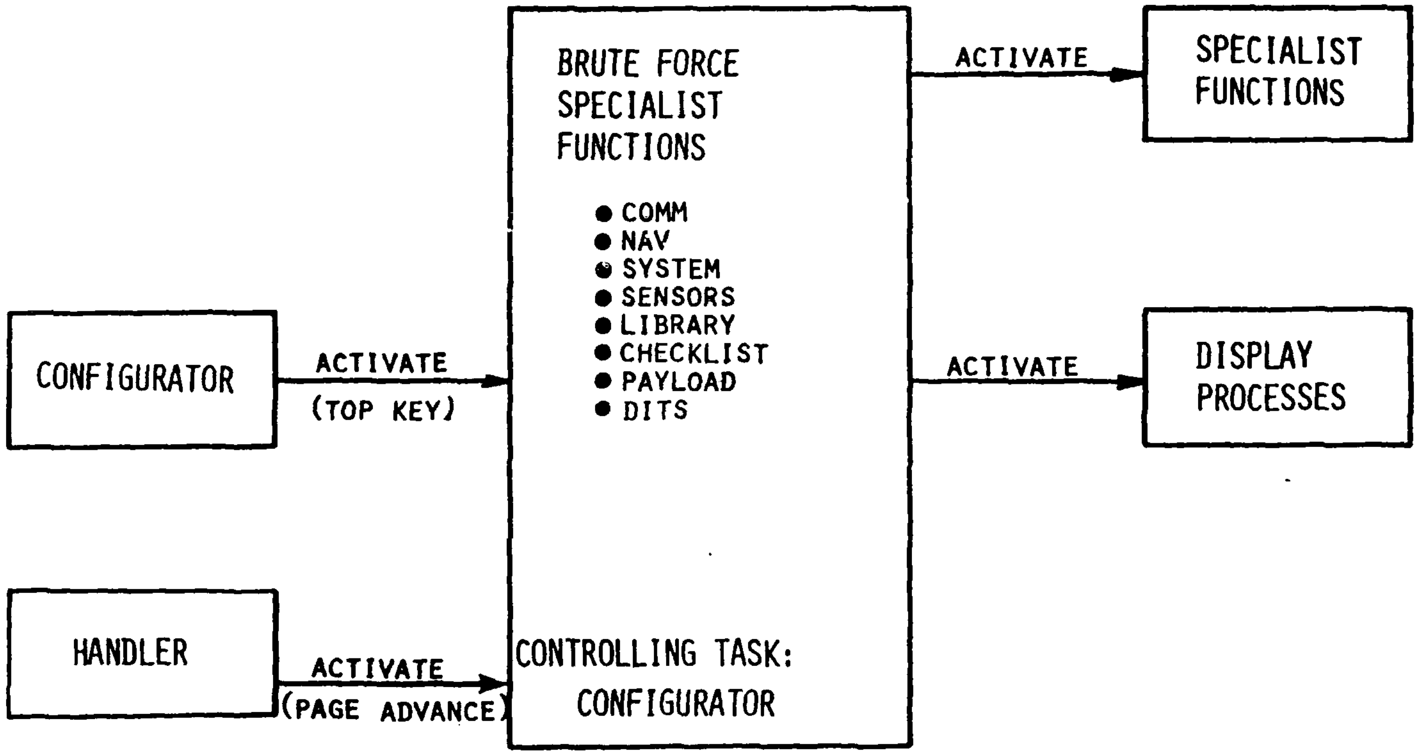


FIGURE 3.1-19 BRUTE FORCE INTERFACE

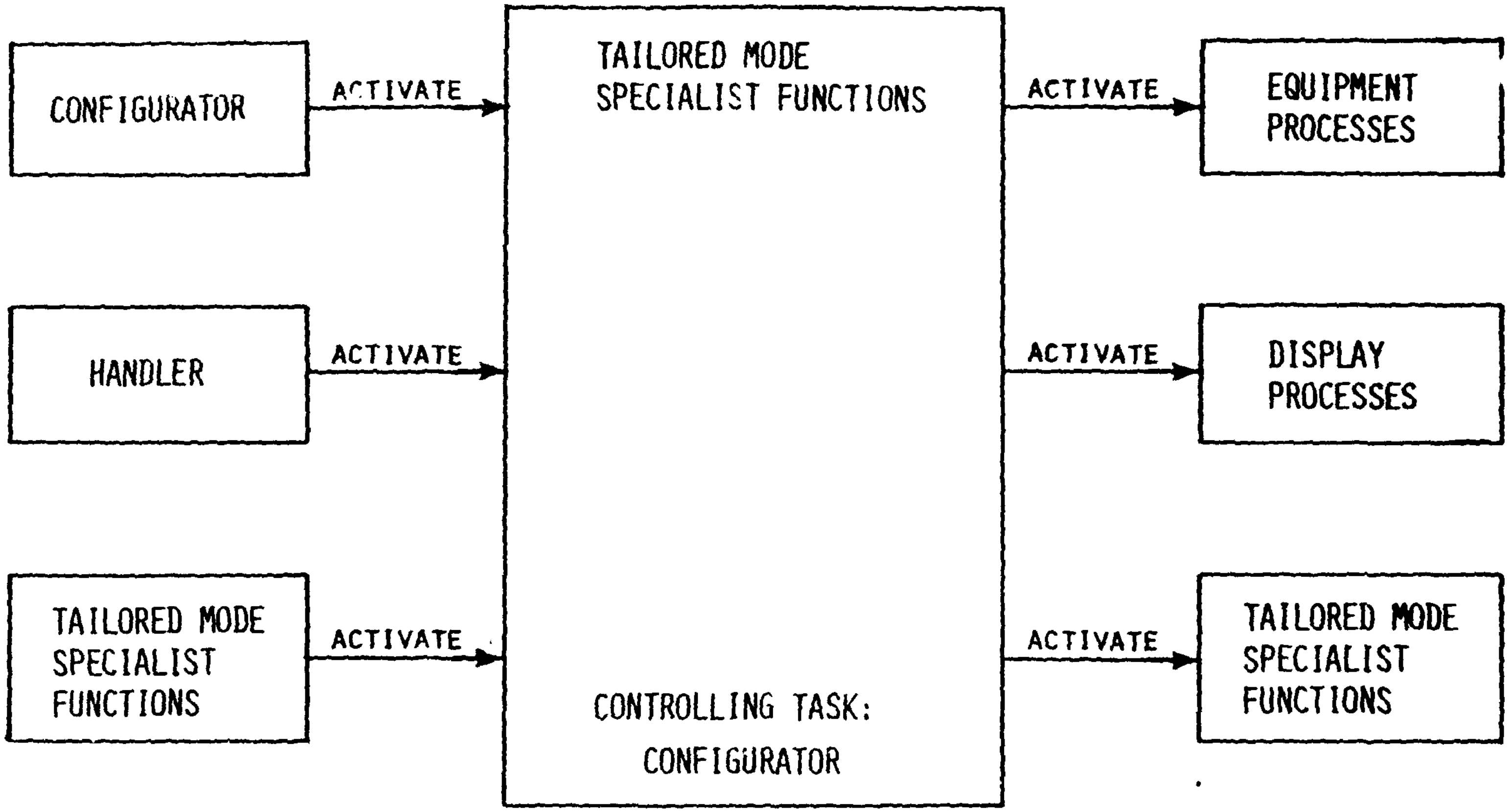


FIGURE 3.1-20 TAILORED MODE SPEC INTERFACE

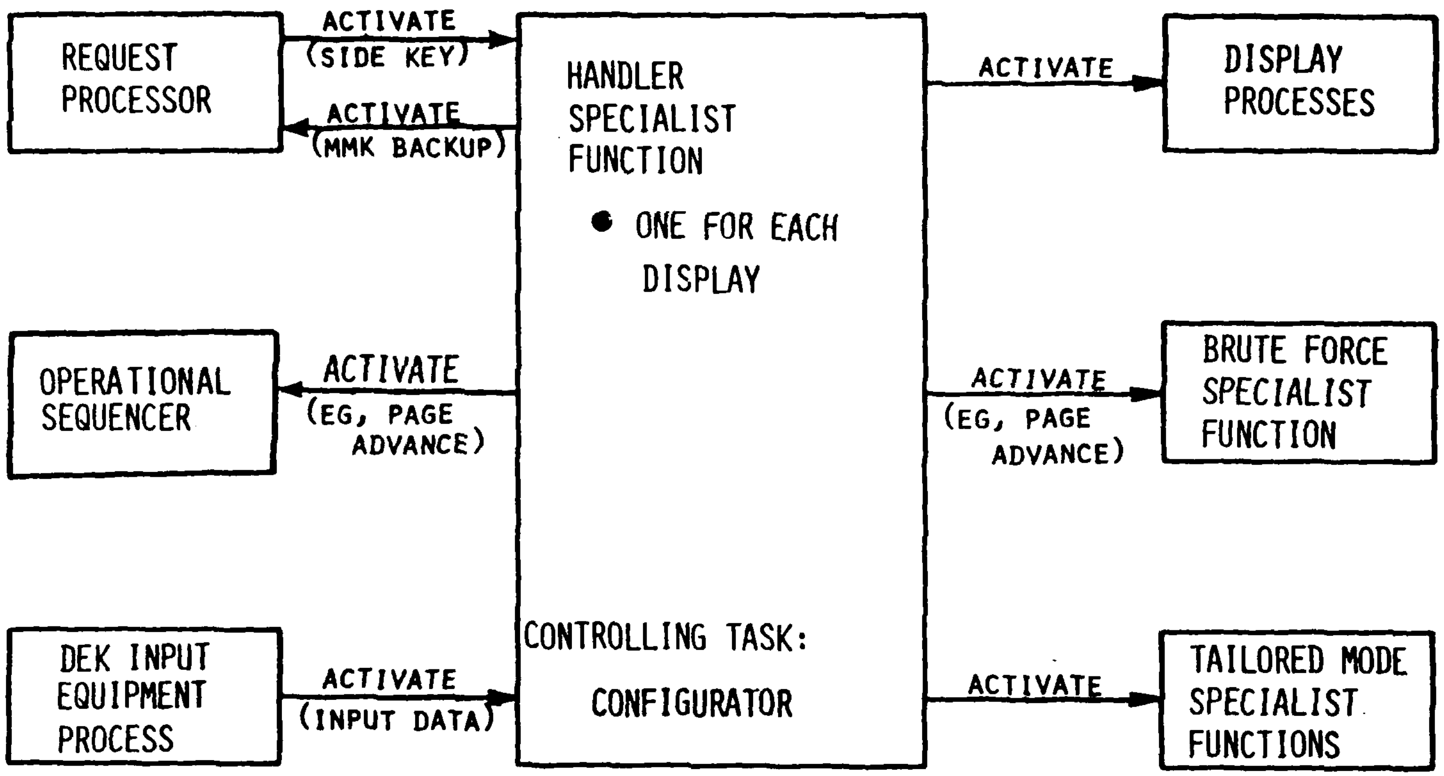


FIGURE 3.1-21 HANDLER INTERFACE

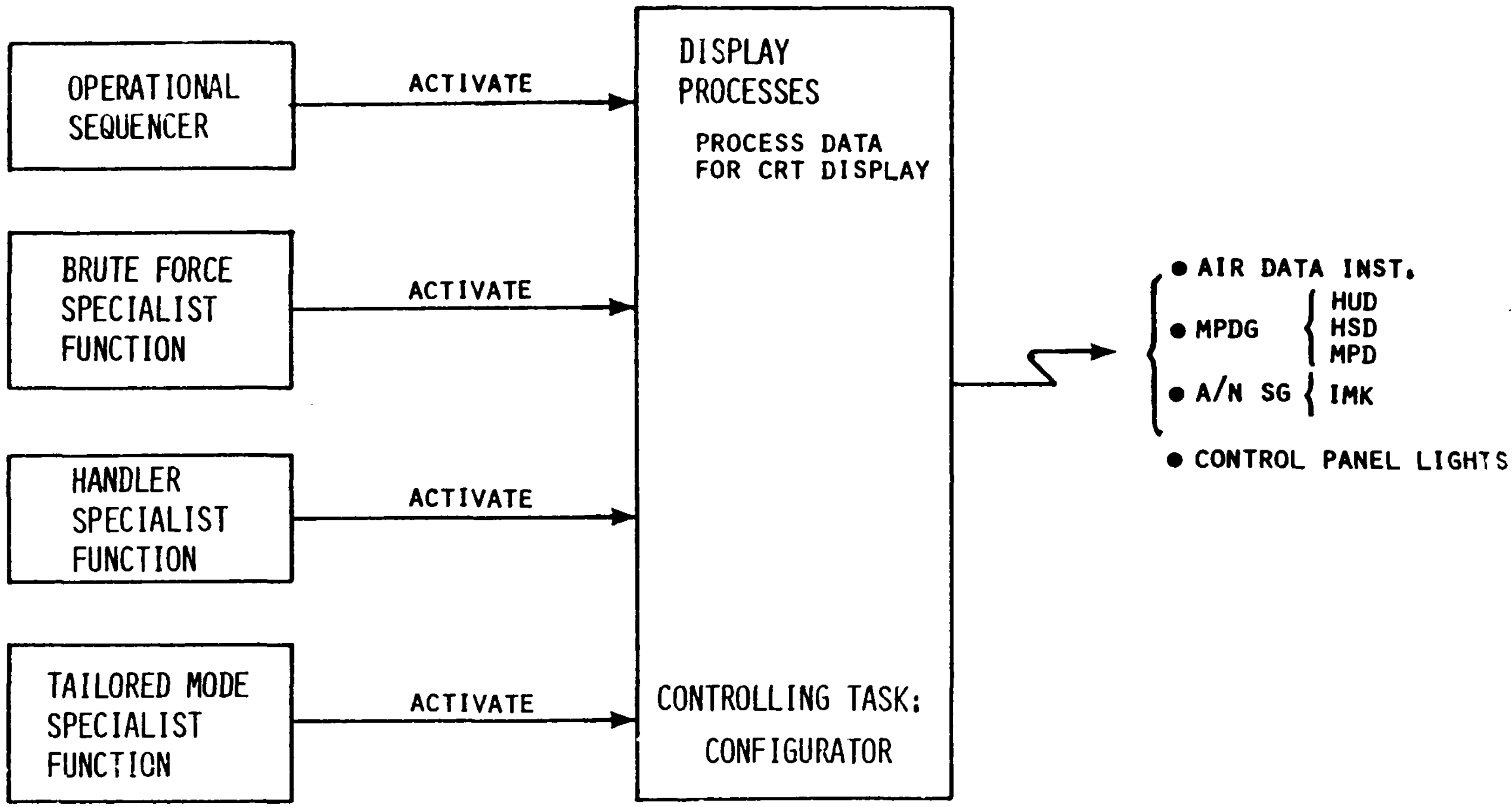


FIGURE 3.1-22 DISPLAY PROCESSES INTERFACE

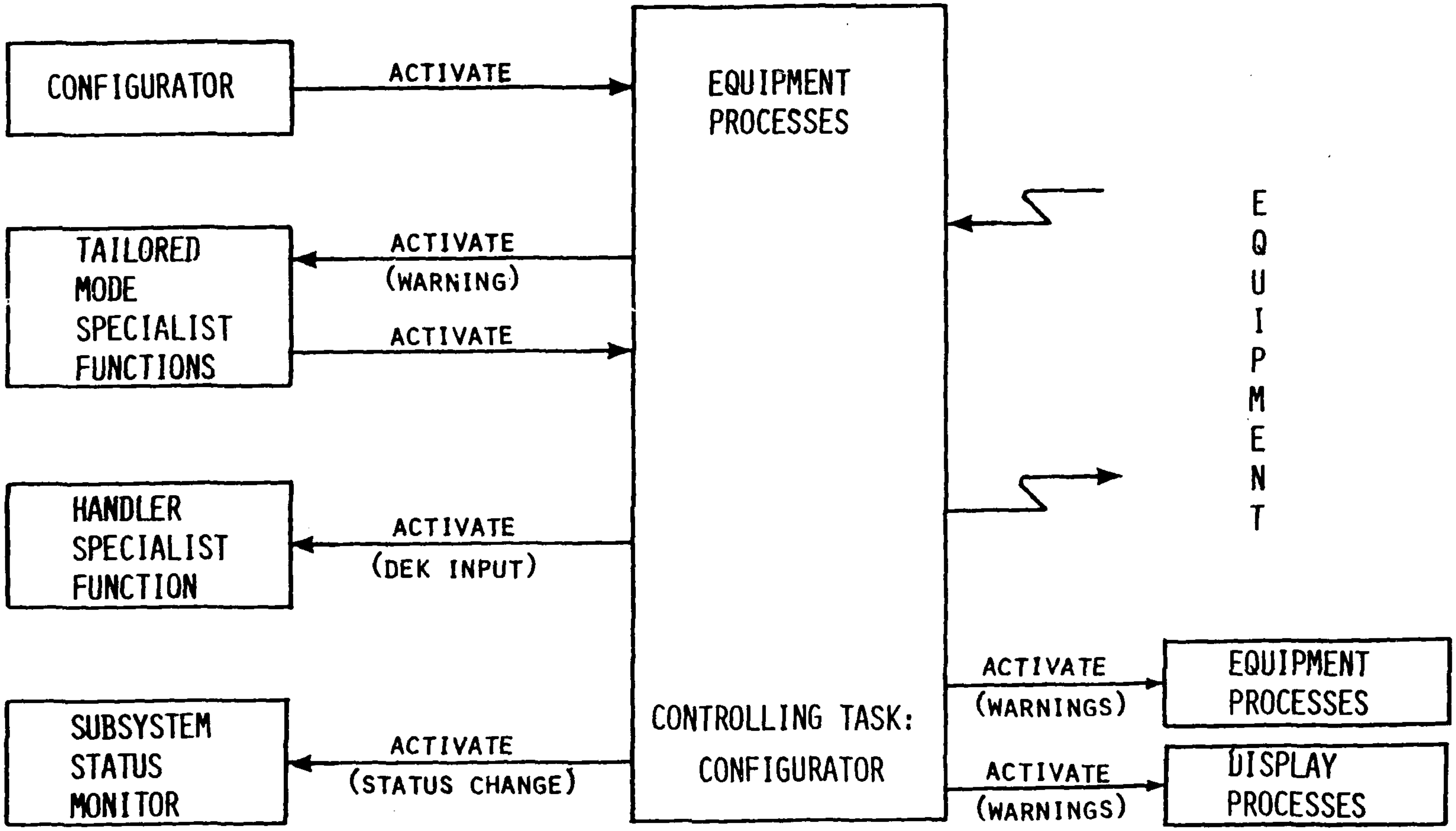


FIGURE 3.1-23 EQUIPMENT PROCESSES INTERFACE

3.1.2.2 Software Relationships

This section describes the control and data relationships of the various software components comprising the Application Software.

Figure 3.1.2-12 shows the primary control/data interfaces for the Applications Software. Appearing below is a more detailed explanation of each control interface:

1. Cyclic activation via Executive initiated by the Configurator. Activation of cyclic mode-dependent Computational Specialist Functions and Display Processes is initiated by the Configurator during transition from one mission mode to another.

   The Computational Specialist Functions access data residing in a Compool for their calculations, and store the results in another software compool.

2. Cyclic activation initiated and cancelled by the Configurator. Activation of cyclic Equipment Processes, Air Data Display Processes, and certain Computational Specialist Functions is initiated by the Configurator during transition from the INITIALIZE mode.

   Each input Equipment Process will access data moved by the Executive to a Compool, check the device status word, check for validity/reasonableness, generate substitute data (if necessary), convert/format the data, and store the result in an Applications Software Compool. If the device status has changed or if the device is generating incorrect/degraded data, the Subsystem Status Monitor is notified.

   Each output Equipment Process will access data residing in an Applications Software Compool, scale/format the data, and store the result in a Compool for subsequent output.

   Each output Display Porcess will access data residing in an Applications Software Compool, scale/format the data, and store the resulting parameter in a Compool for subsequent output.

3. Cyclic activation by the Executive, initiated when the Request Processor is scheduled by the Master Sequencer.

   The Request Processor will access control panel data residing in a Compool, check the panel status word, decode/interpret any crew input, and store the result in an Applications Software Compool. It will then activate the Subsystem Status Monitor (if panel status has changed) or the IMK Handler Specialist Function (if IMK side key input) or the Configurator (other input).

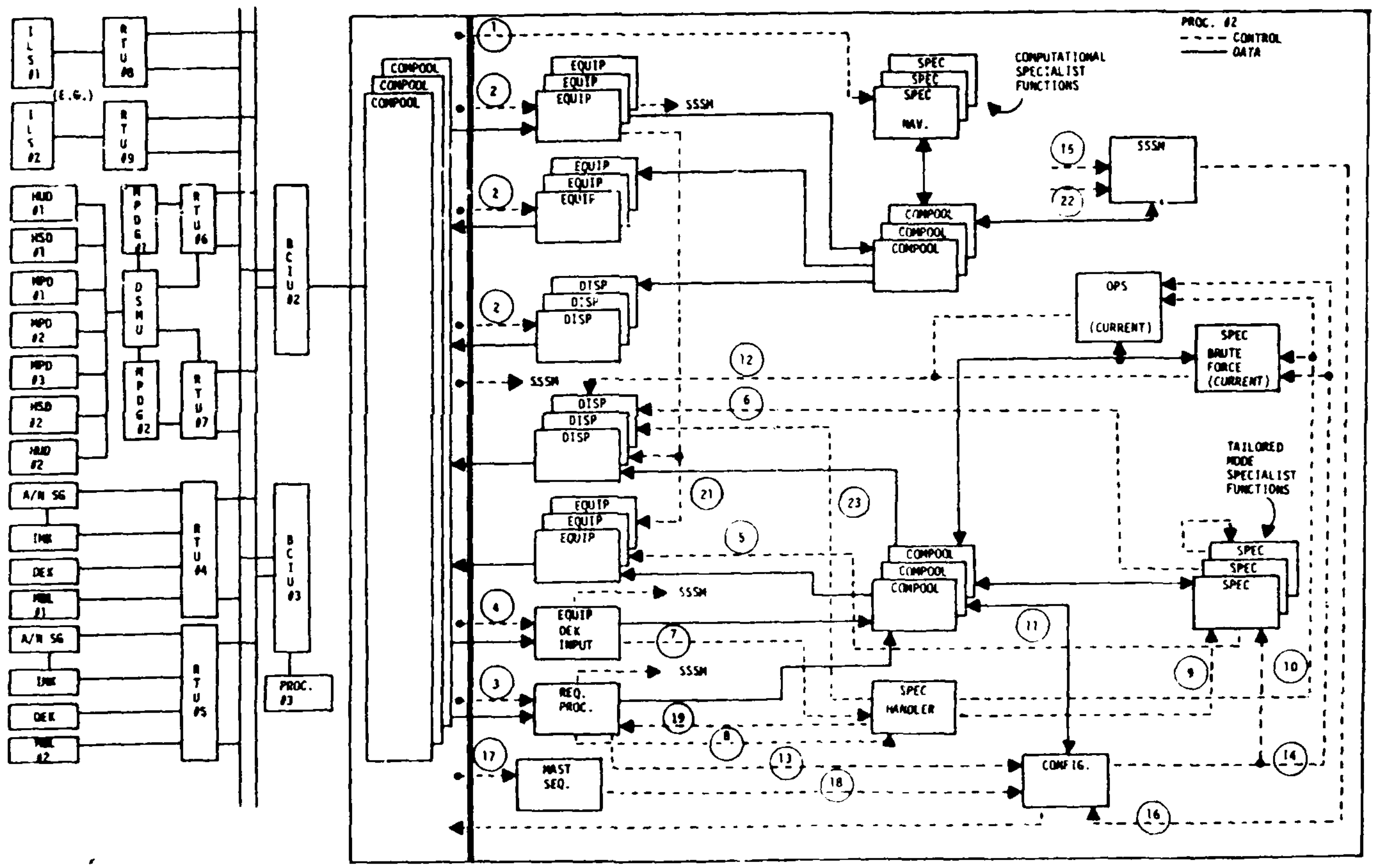


FIGURE 3.1-24 APPLICATIONS SOFTWARE RELATIONSHIPS

4. Synchronous activation by the Executive, initiated by the Handler Specialist Function; this cyclic activation is initiated when a side key select is received which requires DEK input, and is terminated when an Enter Key is recognized.

   The DEK input Equipment Process will access data residing in a Compool, check device status word, and check data for Enter Key indication. If device status has changed, the Subsystem Status Monitor is notified. If an Enter Key is recognized, the input buffer is converted and stored in an Applications Software Compool and the Handler Specialist Function is activated.

5. Demand activation by Tailored Mode Specialist Functions.

   Each output Equipment Process will access data residing in an Applications Software Compool, scale/format the data, and store the result in a Compool for subsequent output to the device.

6. Demand activation by Tailored Mode Specialist Functions.

   Each output Display Process will access data resiging in an Applications Software Compool, scale/format the data, and store the resulting parameter in a Compool for subsequent output.

7. Demand activation by DEK input Equipment Process indicating receipt of an Enter Key.

   The Handler Specialist Function will access data residing in an Applications Software Compool pertaining to the IMK activity leading up to the DEK input request, and activate the appropriate Tailored Mode Specialist Function for action. A Display Process will be activated to note on the IMK that required DEK input is complete.

8. Demand activation by the Request Processor indicating receipt of an IMK side key.

   The Handler Specialist Function will access data residing in a Compool, and if the indicated side key requires DEK input, cyclic activation of the DEK input Equipment Process will be initiated (via request to Executive Software), and a Display Process will be activated to note on the IMK that input is required.

   If the side key requires a new IMK CRT page to be displayed, the current Brute Force Specialist Function, or if none, the current Operational Sequence, is activated to accomplish this.

   IMK key status/history and other status pertaining to the IMK Handler Specialist Function is stored in an Applications Software Compool.

9. Demand activation by the Handler Specialist Function indicating that processing of crew input selections (IMK side key and/or DEK input) is required.

   The tailored Mode Specialist Function will access data residing in an Applications Software Compool (both input and status data), determine validity, perform processing, and store results in an Applications Software Compool. The proper Equipment Process will be activated to complete the data transfer to the device.

   Further, if the data requires an update of a current display, a Display Process is activated.

10. Demand activation by the Handler Specialist Function requesting a new CRT page.

    The Operational Sequencer or Brute Force Specialist Function will access data residing in an Applications Software Compool and display the new CRT page.

11. Demand activation by the Handler Specialist Function to display parameter values or to indicate DEK activity.

    The Display Process will access data residing in an Applications Software Compool, scale/format the data if necessary, and store the result in an Executive Software Compool for subsequent output.

12. Demand activation by the Brute Force Specialist Function or Operational Sequencer to display the new display page.

    The Display Process will access data residing in an Applications Software Compool, scale/format the data if necessary, and store the result in an Executive Software Compool for subsequent output.

13. Demand activation by the Request Processor because of a control panel input.

    The Configurator will access the input data residing in an Applications Software Compool and activate the appropriate Tailored Mode Specialist Function, Brute Force Specialist Function, or Operational Sequencer to perform the necessary processing.

14. Demand activation by the Configurator because of control panel input.

    The Tailored Mode Specialist Function corresponding to the type of input (HCU, CCA, MFDC) will access data residing in an Applications Software Compool, and perform the processing required to satisfy the request. A Display Process will be activated to control panel lamp configuration.

The Operational Sequencer associated with the MMK selection will perform the necessary processing and control to establish the new mission mode. Display Processes will be activated to control new IMK/MPD pages, as well as panel lamp configuration.

The Brute Force Specialist Function associated with the IMK top key will perform the necessary processing to satisfy the request. The request may be to cancel the current Brute Force Specialist Function, change to another one, or establish a new one. Display Processes will be activated to control CRT pages on the IMK(s) and to control the top key lamp configuration.

15. Demand activation by input Equipment Processes or by the Request Processor.

    The Subsystem Status Monitor will access data residing in an Applications Software Compool and store, if appropriate, in an Applications Software Compool to maintain the equipment status. If current status indicates a failure requiring a different software configuration, the configurator is activated.

16. Demand activation by the Subsystem Status Monitor indicating an equipment health problem.

    The Configurator will access data residing in an Applications Software Compool and etermine requires action. The Executive Software will be notified if the equipment failure is severe. Software re-configuration because of less severe failures will be handled by the Configurator.

17. One-time-only activation by the Executive to start the Applications Software.

    The Master Sequencer will perform required initialization processing, and activate the Configurator to mode the Applications Software.

18. One-time-only activation by the Master Sequencer for Applications Software startup.

    The Configurator will perform any required processing, and activate an Operational Processor to put the Application Software into an INITIALIZE mission mode.

19. Demand activation by the IMK Handler Specialist Function indicating the selection of a master mode from the MMK backup pages on the IMK.

    Request Processor will process the input as it would MMK pushbutton input.

20. The Configurator will notify an Executive task for failures it cannot handle.

21. Demand activation by an EQUIP which determines a situation requiring a "WARN" action (e.g., CCA Shaker, Low Speed Warning Light, etc.).

22. Demand activation by the Executive when a device failure is detected.

23. Demand activation by Handler SPECs for IMK or MPD functions relating to DEK input, MPD checklist activity, new display pages.

This page intentionally left blank.

3.2 Detailed Functional Requirements

This section specifies the detailed functional requirements for the Applications Software.

The software components identified to satisfy these requirements are shown in Figure 3.2-1.

3.2.1 System Control Modules

3.2.1.1 Master Sequencer

The Master Sequencer performs data initialization, and initiates the scheduling and execution of the other System Control Modules.

3.2.1.1.1. Inputs

Input shall be TBD data required for initialization of the Applications Software.

3.2.1.1.2 Processing

Upon activation by the Executive, the Master Sequencer shall

- o initialize mission data and carry out other initialization tasks for the particular software configuration
- o schedule the request processor, configurator, and sub-system status monitor tasks
- o activate the configurator

3.2.1.1.3 Outputs

None.

3.2.1.2 Request Processor

The Request Processor receives and interprets control panel input requests. It is activated 8 times per second.

3.2.1.2.1 Inputs

Input shall consist of

- o MMK Status, Pushbutton # (2 words)
- o IMK Status, Top/Side Key # (2 words)
- o MFDC Pushbutton # (1 word)
- o CCA Status, Pushbutton # (2 words)
- o HCU Status, Pushbutton # (2 words)
- o MMK Backup Mode Select (1 word)

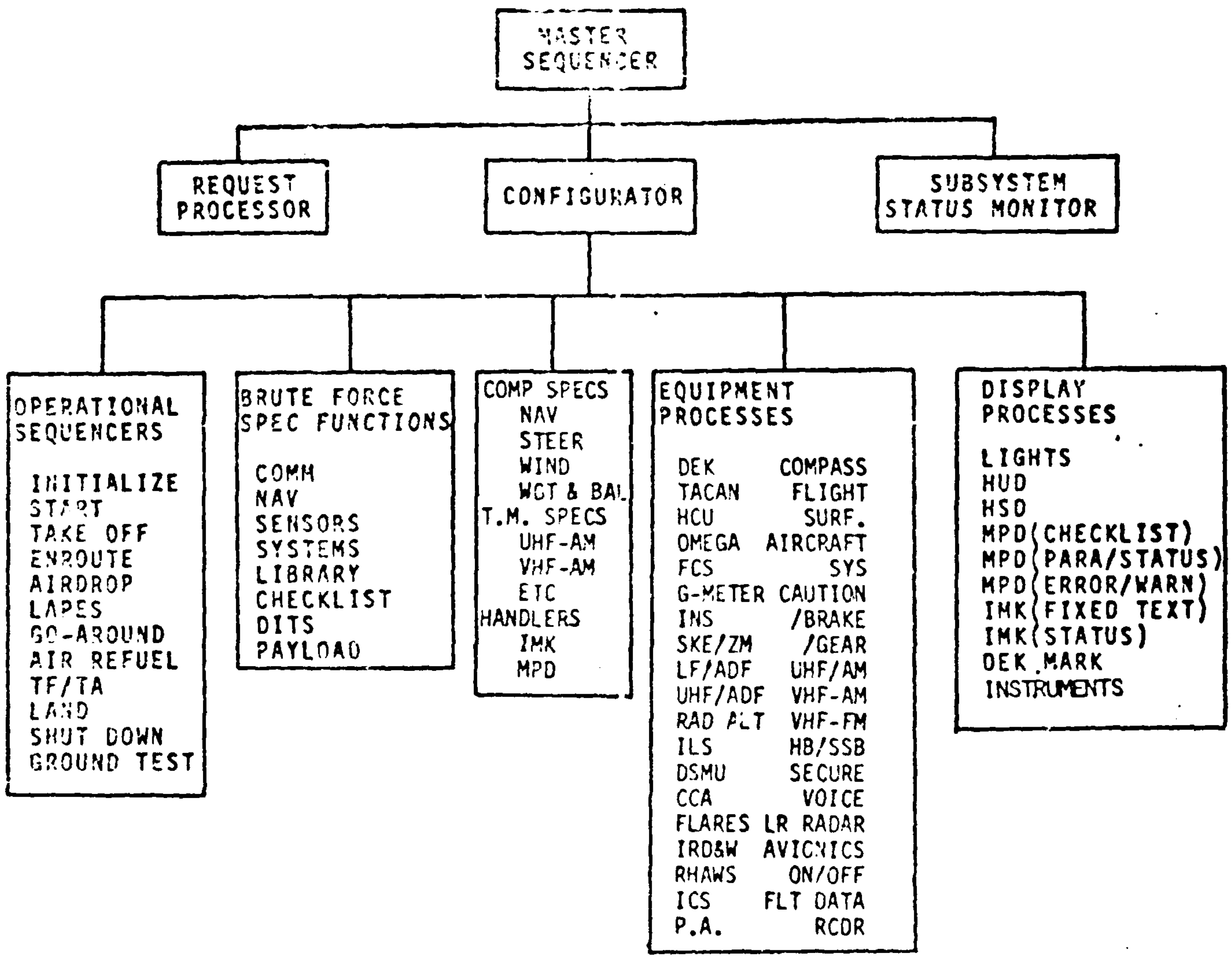


FIGURE 3.2-1 APPLICATION SOFTWARE COMPONENTS

3.2.1.2.2 Processing

The Request Processor shall access the input panel data to determine if any data has changed. If no change has occurred since the last activation, the Request Processor shall terminate.

If the input data from an IMK shows a side key select, the IMK Handler Specialist Function shall be activated; the Configurator shall be activated for IMK top key selections.

Valid pushbutton input from other source devices shall also cause the Configurator to be activated. The following pushbutton input shall be ignored:

- o non-supported pushbuttons (spares)
- o MMK input which would result in an out-of-sequence Master Mode situation (TBD)
- o MMK input identical to current MMK setting (i.e., repeated selection of same pushbutton)

The Request Processor is activated by the IMK Handler Specialist Function whenever the Master Mode backup capability is used. The processing shall be the same as the MMK input.

The Request Processor shall activate the Subsystem Status Monitor whenever the panel mode/health status changes.

3.2.1.2.3 Outputs

None.

3.2.1.3 Configurator

The Configurator controls the moding/operation of the application tasks.

3.2.1.3.1 Inputs

Input shall consist of:

- o control panel input-pushbutton numbers (4 words)
- o equipment failure message (2 words)

3.2.1.3.2 Processing

Upon activation by the Master Sequencer, the Configurator shall schedule and activate the INITIALIZE Operational Sequencer.

When activated by the Request Processor because of MMK select, the Configurator shall

- o cancel the current Operational Sequencer
- o set up the task configuration necessary for the new mode
- o activate the new Operational Sequencer

When activated by the Request Processor because of an HCU, CCA, or MFDC request, the CONFIG shall activate the appropriate Tailored Mode Specialist Function.

When activated by the Request Processor because of an IMK top key select, the CONFIG shall determine whether the new key select is identical to the previous one. If the new key select is different, the Configurator shall

- o cancel the current Brute Force Specialist Function
- o set up the necessary task configuration
- o activate the new Brute Force Specialist Function

If the key select is the same as the previous one (i.e., the IMK top key selected by the crew was backlighted green), the Configurator shall

- o cancel the corresponding Brute Force Specialist Function
- o set up the task configuration necessary for full resumption of the Operational Sequencer corresponding to the current Master Mode
- o activate the Operational Sequencer to initialize IMK CRT displays

When the Configurator is notified by the Sub-System Status Monitor of an equipment health problem, the Configurator shall inform the crew via MPD and either 1) re-configure to a backup or perhaps degraded mode for severe failures or 2) request the crew to take action. The Configurator shall signal the Master Executive for failures that it cannot properly handle.

3.2.1.3.3 Outputs

Output shall consist of

- o Equipment failure message ID (1 word), MPD
- o Equipment failure notification (1 word), EXEC

3.2.1.4 Subsystem Status Monitor

The Subsystem Status Monitor maintains status of the avionics subsystems, and monitors changes in status.

3 2.1.4.1 Inputs

Input shall consist of

- o Control panel status (4 words)
- o Device/sensor status (1 word)

3.2.1.4.2 Processing

The Subsystem Status Monitor is activated by the Request Processor upon a control panel failure or status change, or by an Equipment Process whenever a sensor has failed or is producing invalid/degraded data.

The Subsystem Status Monitor shall store the status to maintain error history and statistics. If an analysis of the data indicates a critical error, the Configurator shall be activated to perform error recovery.

3.2.1.4.3 Outputs

Output shall be a one word message to the Configurator indicating the change in status of the subsystem.

- o Status change message (n words)

3.2.2 Operational Sequencers

An Operational Sequencer (OPS) is a task responsible for the control of a particular mission phase, as determined by "Master Mode". It is scheduled, activated, and cancelled by the Configurator, as a result of crew Master Mode selections.

Operational Sequencers have been identified for the following IDAMST mission modes.

- o Initialize
- o Start
- o Takeoff
- o Enroute
- o Air Drop
- o Lapes
- o Go-Around
- o Air Refuel
- o TF/TA
- o Land
- o Shutdown
- o Ground Test

3.2.2.1 Inputs

Input shall consist of

- o Next Display ID (1 word)

3.2.2.2 Processing

OPS control processing begins when the pilot selects a mission mode by depressing an MMK pushbotton or by depressing an MMK pushbotton or by depressing an IMK side key associated with the master mode backup display page. Processing continues until another master mode is selected or until the OPS is interrupted (suspended) by selecting a Brute Force Spec.

Initial processing common to all Operational Sequencers upon activation by the Configurator because of MMK input **shall be**

- o Commanding MMK light configuration to correspond to the Master Mode selection
- o Commanding IMK top key light configuration to OFF
- o Initiating tasks to generate those HUD, HSD, MPD displays defined for the master mode
- o Setting a DISP flag to change Master Mode in the MPDG
- o Cancelling the IMK Status DISP if active
- o Displaying a control page on each IMK CRT (this page contains the top level control capability available for the Master Mode)
- o Activating the IMK Status DISP if necessary

Further, OPS processing depends on subsequent IMK side-key activation. The OPS **shall** display other (lower level) control pages as directed by the crew via side key selection.

When the OPS is notified by the IMK Handler to put up another display page (because of an "advance page" indicator or side key #), the OPS **shall**

- o Cancel the IMK Status DISP if necessary
- o Display the requested page by activating the IMK Fixed Test DISP
- o Activate the IMK Status DISP if necessary

When a Brute Force Specialist Function is cancelled, the OPS is activated by the Configurator and **shall**

- o Cancel the IMK Status DISP if active
- o Display the top-level control page on the IMK CRT
- o Activate the IMK Status DISP if necessary
- o Set IMK top key lamps OFF

3.2.2.3 Outputs

Output **shall consist of**

- o MMK lamp on/off message (1 word)
- o IMK lamp off message (1 word)

3.2.3 Specialist Functions

3.2.3.1 Brute Force Specialist Functions

Brute Force Specialist Functions allow the crew to perform certain mission operations not automatically available to the Current OPS processing. These functions are scheduled, activated, and cancelled by the Configurator as a result of IMK top key selection by the crew.

Brute Force Specialist Functions have been identified for the following IDAMST functions:

- Navigation
- Communications
- Sensors
- Systems
- Library
- Checklist
- Payload
- DITS

3.2.3.1.1 Inputs

Input to any Brute Force Specialist Function **shall consist of**

- Next display ID (1 word)

3.2.3.1.2 Processing

Brute Force Specialist Function processing begins after being activated by the Configurator as a result of an IMK top key selection. Processing continues until there is another top key selection or until there is a Master Mode change. Initial processing common to all Brute Force Specialist Functions upon activation by the Configurator **shall consist of**

- Commanding IMK top key lamp configuration
- Cancelling the IMK Status DISP if active
- Initiating tasks to generate any HUD, HSD, MPD displays defined for the particular Brute Force SPEC
- Displaying a control page on the requesting IMK CRT and activating the IMK Status DISP if necessary; this page contains the top level capability available for the function (i.e., Communication).

Further, Brute Force SPEC processing depends on subsequent IMK side-key activation. The Brute Force SPEC **shall** display other (lower level) control pages as directed by the crew via side key selection.

When the Brute Force SPEC is notified by the IMK Handler to put up another display page (because of an "Advance Page" indicator or side key #), **it shall**

- Cancel the IMK Status DISP if active
- Display the required page on the IMK CRT
- Activate the IMK Status DISP if necessary

3.2.3.1.3 Outputs

Output **shall consist of**

- IMK lamp control (1 word)

3.2.3.2 Computational Specialist Functions

Computational Specialist Functions carry out cyclic processing, and are either active throughout the mission (e.g., navigation) or throughout a particular mission mode (e.g., CARP).

Computational Specialist Functions have been identified for the following IDAMST functions:

- o navigation
- o steering
- o wind calculation
- o weights and balances

3.2.3.2.1 Navigation Computational Specialist Function

The Navigation SPEC is responsible for keeping track of the aircraft state, using input data from various sensor sources and from the crew. It is activated by the Configurator upon a Master Mode selection by the crew.

The Applications Software navigation function consists of the following subfunctions:

- o control
- o navigation modes:
  - auto
  - INS
  - OMEGA
- o manual update (position)
- o flight director
- o OMEGA
- o magnetic heading
- o CARP
- o rendezvous
- o go-around

3.2.3.2.1.1 Control Subfunction

This subfunction provides overall control of aircraft navigation computation. It is activated four times a second throughout most of the flight.

3.2.3.2.1.1.1 Inputs

Input shall consist of

- o status (n words)
- o device moding (n words)
- o master mode (1 word)
- o navigation mode (1 word)

3.2.3.2.1.1.2 Processing

This subfunction shall control the navigation computation procedure by determining from Master Mode, device status, device moding, etc., the appropriate operational sequence.

3.2.3.2.1.1.3 Outputs

None.

3.2.3.2.1.2 Auto Mode

The Auto Mode subfunction provides for automatic (computer controlled) integrated navigation. The following functions are included:

- o flight planning
- o subsystem management
- o optimum position calculation/update
- o horizontal, vertical guidance calculation
- o performance monitoring
- o map display parameter update
- o augmented ILS

3.2.3.2.1.2.1 Inputs

Inputs for the various Auto mode subfunctions shall consist of .

- o navigation subsystem data, as applicable (n words)
  - LF ADF - bearing
  - UHF ADF - bearing
  - VOR/ILS - bearing, loc/GS deviation
  - Radar Alt - altitude
  - OMEGA - position, velocity
  - Compass - heading
  - TACAN - bearing, distance
  - INS - position, velocity, attitude
  - SKE/ZM - range, bearing
  - Flight Controls - pitch, roll, turn rate, altitude, airspeed, TAS, altitude rate, vertical speed
- o IMK input data (n words)
  - Initialization data
  - Flight plan modifications
  - Subsystem control
  - Position update
- o HCU position update (n words)
- o Marker beacon data (n words)
- o Device status/moding (n words)

3.2.3.2.1.2.2 Processing

Auto navigation processing shall include the following capability:

Flight Planning

- o organize/store appropriate Standard Instrument Departure (SID) and flight plan
- o execute/modify the flight plan as directed

Subsystem Management

- o perform initialization
- o tune radios from flight plan data
- o verify subsystem performance

Optimum Position Calculation/Update

- o combine various NAVAID data to derive optimum position
- o auto update
- o update optimum position with manual input data

Horizontal, Vertical Guidance Calculation

- o compare present position with flight plan to derive guidance information

Performance Monitoring

- o establish and monitor subsystem performance criteria
- o estimate navigation accuracy and compare with mission requirements

Map Display Parameter Update

- o update present position and map display requirements

Augmented ILS (Land Mode)

- o synthesize and smooth ILS data
- o computationally construct approach NAVAID

3.2.3.2.1.2.3 Outputs

Output shall consist of

- o flight instrument display parameters

3.2.3.2.1.3 INS Mode

This subfunction provides navigation capability using only input from INS. Updates can be performed manually.

It is activated by the Control subfunction four times per second whenever the INS mode has been selected.

3.2.3.2.1.3.1 Inputs

Input shall consist of

- o INS data - position, velocity, acceleration (n words)
- o flight plan information (n words)
- o radar updates (n words)
- o visual updates (n words)

3.2.3.2.1.3.2 Processing

Subfunction processing shall provide capability to

- o maintain INS position
- o execute/maintain flight plan and calculate INS guidance outputs
- o INS manual update, including reasonableness tests

3.2.3.2.1.3.3 Outputs

Output shall be inertial position and velocity from which INS guidance signals are derived and are available for display:

- o position and velocity (n words)
- o guidance parameters (n words)

3.2.3.2.1.4 OMEGA Mode

This subfunction provides navigation capability using only input from OMEGA.

It is activated four times per second by the Control subfunction whenever the OMEGA mode has been selected.

3.2.3.2.1.4.1 Inputs

Input shall consist of

- o OMEGA position, velocity (n words)
- o TAS (1 word)
- o heading (1 word)
- o flight plan information (n words)

3.2.3.2.1.4.2 Processing

Subfunction processing shall provide capability to

- o maintain OMEGA psoition
- o execute/maintain flight plan and calculate OMEGA guidance outputs
- o perform OMEGA smoothing with TAS and heading

3.2.3.2.1.4.3 Outputs

Output shall be OMEGA position and velocity from which OMEGA guidance signals are derived and are available for display:

- o position, velocity (n words)
- o guidance parameters (n words)

3.2.3.2.1.5 Manual Position Update

This subfunction generates update information from HCU, SKE/ZM, or IMK inputs.

It is activated by the Control subfunction whenever an update is requested.

3.2.3.2.1.5.1 Inputs

Input **shall consist of present position**

- o latitude, longitude (2 words)

3.2.3.2.1.5.2 Processing

This subfunction shall update position with the input data.

3.2.3.2.1.5.3 Outputs

None.

3.2.3.2.1.6 Flight Director

This subfunction generates flight director commands compatible with HUD to provide guidance to maintain designated flight path.

It is activated by the Control subfunction four times a second throughout the mission if the flight director is functionally switched "on."

3.2.3.2.1.6.1 Inputs

Input shall consist of navigation subsystem data

- o navigation data (n words)

3.2.3.2.1.6.2 Processing

This subfunction shall calculate flight director commands compatible with the HUD.

3.2.3.2.1.6.3 Outputs

Output **shall consist of**

- o pitch command (1 word)
- o roll command (1 word)
- o speed command (1 word)

3.2.3.2.1.7 OMEGA

The OMEGA subfunction converts OMEGA RF input data to airplane position and velocity parameters. It is activated eight times per second by the Control subfunction if the data is used in the navigation calculations, as determined by current navigation moding.

3.2.3.2.1.7.1 Inputs

Input shall consist of

- o three channels RF (n words)
- o navigation mode (1 word)

3.2.3.2.1.7.2 Processing

This subfunction shall convert the input RF input data to OMEGA position and velocity.

3.2.3.2.1.7.3 Outputs

Output shall consist of

- o position, velocity (n words)

3.2.3.2.1.8 Magnetic Heading

This subfunction calculates magnetic heading.

It is activated four times per second throughout the flight by the Control subfunction.

3.2.3.2.1.8.1 Inputs

Input shall consist of

- o present position (n words)
- o stabilized heading (1 word)
- o stored magnetic variation (n words)

3.2.3.2.1.8.2 Processing

This subfunction shall compute magnetic heading for use in referencing radio navigation aids and displays.

3.2.3.2.1.8.3 Outputs

Output shall consist of

- o magnetic heading (1 word)

3.2.3.2.1.9 CARP

The CARP subfunction calculates the air release point for delivering cargo to a ground target.

It is activated four times per second whenever the AIR DROP Master Mode has been selected.

3.2.3.2.1.9.1 Inputs

Input **shall consist of**

- o ground target-latitude, longitude, altitude (3 words)
- o cargo type (n words)
- o cargo weight (n words)
- o wind (2 words)
- o relative fix-range, bearing (2 words)
- o aircraft parameters (n words)

3.2.3.2.1.9.2 Processing

CARP shall perform ballistic calculations to derive guidance and display parameters pertaining to a specified airplane-cargo-target situation.

Additionally, **CARP shall** perform CCIP calculations for display purposes as an aid to pilot when selecting drop point.

3.2.3.2.1.9.3 Outputs

Output **shall consist of**

- o guidance data (n words)
- o display parameters (n words)

3.2.3.2.1.10 Rendezvous

The Rendezvous subfunction computes guidance and steering parameters to enable rendezvous with other aircraft.

It is activated four times per second whenever the AIR REFUEL Master Mode is in effect.

3.2.3.2.1.10.1 Inputs

Input **shall consist of**

- o LR radar cursor position - range, bearing (2 words)
- o UHF ADF - bearing (1 word)
- o TACAN - range, bearing (2 words)
- o IMK - heading, position, air speed, etc. (n words)

3.2.3.2.1.10.2 Processing

This subfunction shall determine the availability/applicability of navigation data sources. For limited data, it shall perform necessary processing to obtain display information for manual steering.

When sufficient data is available, the subfunction shall:

- o calculate target position and associated display parameters
- o perform guidance calculation for intercepts and output flight control system and flight director steering data

3.2.3.2.1.10.3 Outputs

Output shall consist of target data and steering commands:

- o target (n words)
- o steering (n words)

3.2.3.2.1.11 Go-Around

The Go-Around subfunction provides information which enables the pilot to perform a go-around during a missed approach. The missed approach parameters are pre-selected prior to the approach.

This subfunction is activated whenever the GO-AROUND Master Mode is in effect.

3.2.3.2.1.11.1 Inputs

Input shall consist of the missed approach parameters:

- o heading set (1 word)
- o altitude set (1 word)
- o course set (1 word)
- o minimum climb gradient (1 word)
- o course-to-fix (1 word)

3.2.3.2.1.11.2 Processing

Processing shall consist of incorporating the pre-selected, missed approach parameters into the navigation-guidance calculations. Parameters subsequently computed for display shall reflect this change in mode.

3.2.3.2.1.11.3 Outputs

Output shall consist of the selected parameter(s) being stored in a Compool:

- o parameters (n words)

3.2.3.2.2 Steering Computational Specialist Function

The Steering function provides guidance signals to the flight control system. It is activated 16 times per second throughout the flight.

3.2.3.2.2.1 Inputs

Input shall consist of pertinent navigation data

- o navigation data (n words)

3.2.3.2.2.2 Processing

The processing consists of calculating steering signals compatible with the flight control system.

3.2.3.2.2.3 Outputs

Output shall consist of

- o pitch steer (1 word)
- o roll steer (1 word)
- o speed command (1 word)

3.2.3.2.3 Wind Computational Specialist Function

The Wind Computational SPEC calculates wind velocities, used in air drop algorithms and various displays. It is activated eight times per second throughout most of the flight.

3.2.3.2.3.1 Inputs

Inputs shall consist of

- o true airspeed (1 word)
- o aircraft velocity components (2 words)
- o heading (1 word)

3.2.3.2.3.2 Processing

The Wind SPEC shall calculate North and East wind velocity components.

3.2.3.2.3.3 Outputs

Output shall consist of

- o North wind velocity component (1 word)
- o West wind velocity component (1 word)

3.2.3.2.4 Weights and Balances Computational Specialist Function

This SPEC calculates weight and balance information for display purposes. It is activated four times per second throughout the flight.

3.2.3.2.4.1 Inputs

Input shall consist of

- o aircraft weight (n words)
- o cargo data (n words)
- o fuel (n words)
- o etc.

3.2.3.2.4.2 Processing

Current aircraft weight and center of gravity shall be calculated based on fuel, fuel distribution, cargo data, etc.

3.2.3.2.4.3 Outputs

Output shall consist of

- o airplane weight (1 word)
- o center of gravity (1 word)

3.2.3.3 Tailored Mode Specialist Functions

Tailored Mode Specialist Functions perform those functions necessary to process crew control requests via IMK (primarily), MFDC, CCA, and HCU. They are activated by the current Handler Specialist Function to process IMK/DEK input and by the Configurator to process other control requests.

The following paragraphs describe identified IMK, MFDC, CCA, and HCU related Tailored Mode SPECS. Complete definition of LIBRARY, CHECKLIST, PAYLOAD, and DITS IMK control functions will result in the identification of additional Tailored Mode SPECS.

3.2.3.3.1 IMK Tailored Mode Specialist Functions

IMK Tailored Mode SPECS are activated by the current Handler SPEC following the receipt of input (either DEK or IMK side key) requiring processing.

IMK Tailored Mode Specialist Functions have been identified for the following IDAMST functions:

- INS control
- OMEGA control
- ILS control
- radar altimeter control
- TACAN control
- ADF control
- navigation data entry
- navigation data display
- manual navigation moding
- flight director control
- avionics on/off control
- CCA control
- UHF-AM control
- VHF-AM control
- VHF-FM control
- HF/SSB control
- LR radar control
- compass control
- SKE control
- counter measures control
- status monitor and control
- airdrop data entry
- MFDC control
- HCU control

The UHF-AM Tailored Mode SPEC, considered representative of the processing performed by IMK Tailored Mode SPECS, is described below. This SPEC processes requests for UHF-AM control, input via IMK. An example of the IMK software function using this SPEC is shown in Figure 3.2-2.

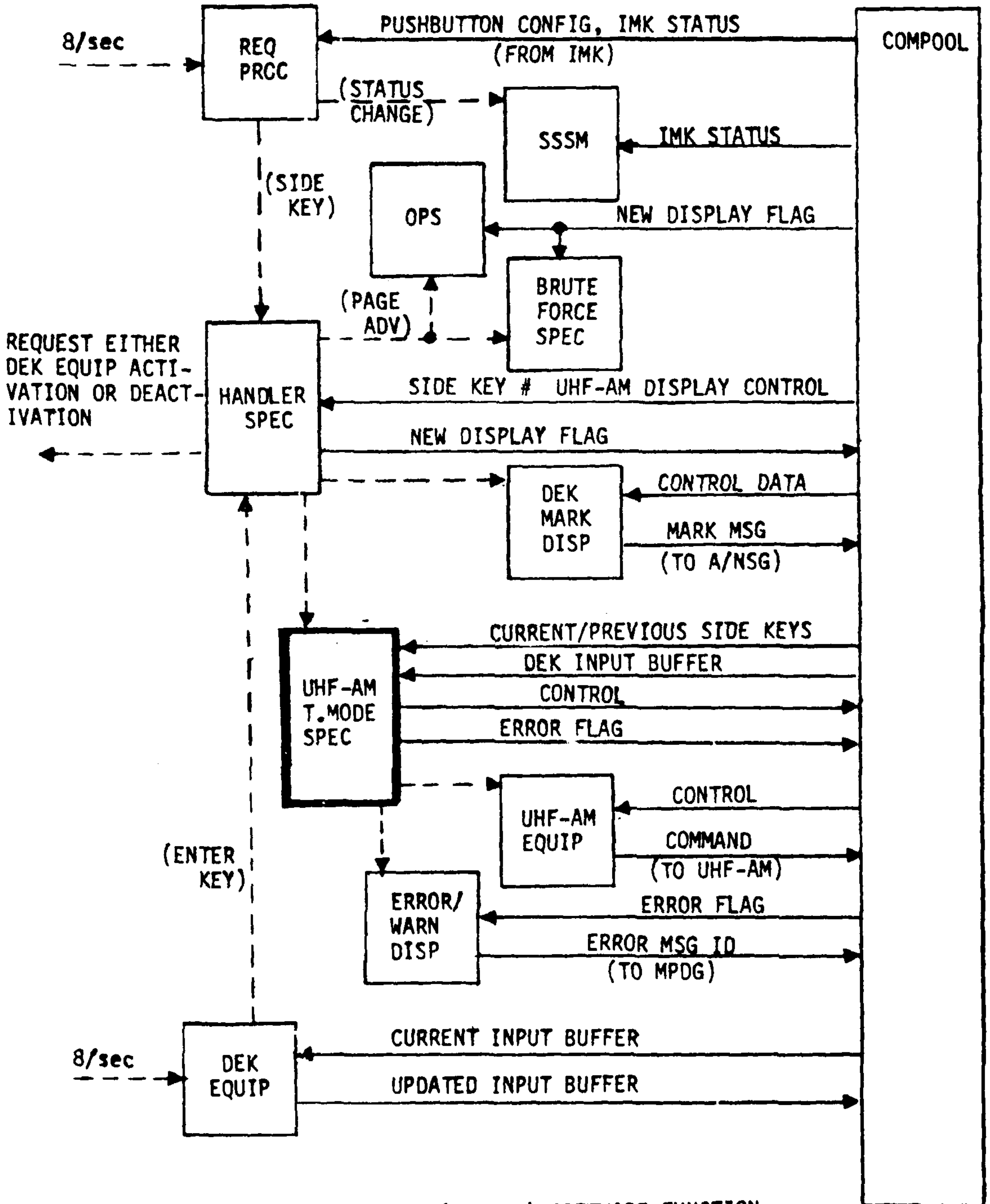


FIGURE 3.2-2 IMK(UHF-AM) SOFTWARE FUNCTION

3.2.3.3.1.1 Inputs

Input shall consist of IMK side key history and, if applicable, a DEK input buffer:

- o present and previous IMK side keys (2 words)
- o DEK input buffer (n words)

Additionally, certain Tailored Mode SPECS shall need status data and/or other data for its processing. The UHF-AM Tailored Mode SPEC, for example, shall require a channel versus frequency table for certain processing.

3.2.3.3.1.2 Processing

The last side key selected shall determine the type of processing required. For the UHF-AM Tailored Mode SPEC, the side keys represent the following control:

1. off
2. T/R
3. T/R+G
4. ADF
5. Guard Xmit
6. channel select
7. frequency select
8. channel preset
9. squelch disable
10. volume

The previous side key shall determine the particular radio to be referenced. For the UHF-AM Tailored Mode SPEC, they represent:

1. UHF-AM #1
6. UHF-AM #2

Processing for side key numbers 1, 2, 3, 5, 9 shall consist of activating the UHF-AM EQUIP to send the proper control message.

Side key number 4 (ADF) select shall cause the status of the normal ADF capability to be checked. If normal ADF is operational, the control request shall be rejected. Otherwise, the UHF-AM EQUIP shall be activated to send the ADF mode control message.

Side key numbers 6, 7, 8, 10 have associated DEK input. The DEK input buffer shall be decoded with respect to the specific side key and checked. If invalid (e.g., out-of-range) the control request shall be rejected. If valid, processing shall consist of:

- o Side key 6 (channel select) - The frequency corresponding to the selected channel is obtained from a frequency versus channel table residing in a Compool. The UHF-AM EQUIP is then requested to send this frequency to the radio.

- o Side key 7 (frequency select) - The UHF-AM EQUIP is requested to send the input frequency to the radio.
- o Side key 8 (channel preset) - DEK input for this side key consists of channel number and frequency. The Tailored Mode SPEC replaces the frequency value currently tabled versus channel number with the input frequency. Side key 8 results only in a Compool update; the UHF-AM EQUIP is not referenced.
- o Side key 10 (volume) - The UHF-AM EQUIP is activated to send the input volume to the radio.

Upon receipt of valid input, the IMK symbol (displayed to indicate that DEK input was necessary) shall be removed by activating the DEK Mark DISP.

3.2.3.3.1.3 Outputs

Output shall be the desired control message to the EQUIP and/or Compool updates:

- o EQUIP control (1 word)
- o update data (n words)

3.2.3.3.2 MFDC Tailored Mode Specialist Function

The MFDC Tailored Mode SPEC provides the logic necessary to control MFDC pushbutton input. It is activated by the configurator when an MPD/HSD pushbutton is pressed. Figure 3.2-3 shows overall MFDC software function.

3.2.3.3.2.1 *Inputs*

Input shall consist of:

- o pushbutton status, each device (5 words)
- o current pushbutton select (1 word)

3.2.3.3.2.2 Processing

The MFDC Tailored Mode SPEC shall determine whether the input is legal and, if so, implement the desired display control.

The DSMU EQUIP shall be activated if display switching is requested (e.g., switching HSD #1 display to the MPD #1 device).

The HSD DISP shall be activated if display revision is requested (e.g., HSD scaling).

The MDSC EQUIP shall be activated if a video display is requested (e.g., radar).

The LIGHTS DISP shall be activated to command the lamp configuration corresponding to the pushbutton status (as updated with new one).

If the pushbutton request is illegal (TBD) or if it cannot be satisfied

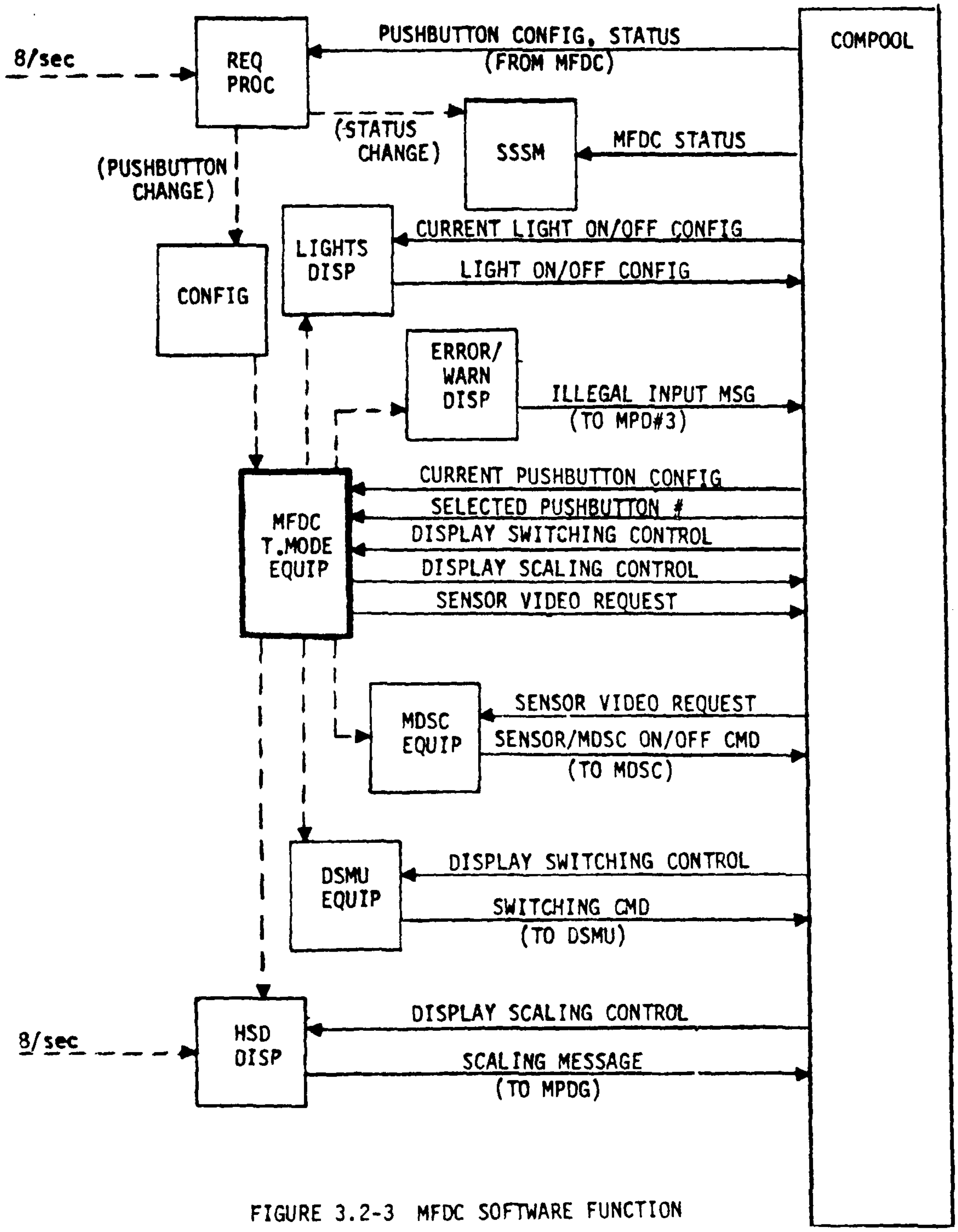


FIGURE 3.2-3 MFDC SOFTWARE FUNCTION

(e.g., radar turned off), an appropriate message shall be output to MPD #3.

3.2.3.3.2.3 Outputs

Output shall be the following control messages to be acted on by an EQUIP:

- o display switching (1 word)
- o display scaling (1 word)
- o radar/SKE/ECM display request (1 word)
- o MPD messages ID (1 word)

3.2.3.3.3 CCA Tailored Mode Specialist Function

The CCA Tailored Mode SPEC provides control logic to handle CCA pushbutton input. It is activated by the configurator whenever the CCA pushbutton is pressed. Figure 3.2-4 shows the overall CCA (pushbutton) software function.

3.2.3.3.3.1 Inputs

Input shall consist of

- o pushbutton identification (1 word)
- o current button status (1 word)

3.2.3.3.3.2 Processing

The CCA Tailored Mode SPEC shall activate the ICS EQUIP to implement the desired control:

- o if hot-mic is "on," the EQUIP is requested to switch it "off"
- o if hot-mic is "off," the EQUIP is requested to turn it "on"

3.2.3.3.3.3 Outputs

Output shall consist of

- o hot-mic on/off control (1 word)

3.2.3.3.4 HCU Tailored Mode Specialist Function

The HCU Tailored Mode SPEC provides control logic to handle HCU display or radar antenna functions. It is activated by the configurator whenever control is requested via the pushbutton selects. Figure 3.2-5 shows the overall HCU software function.

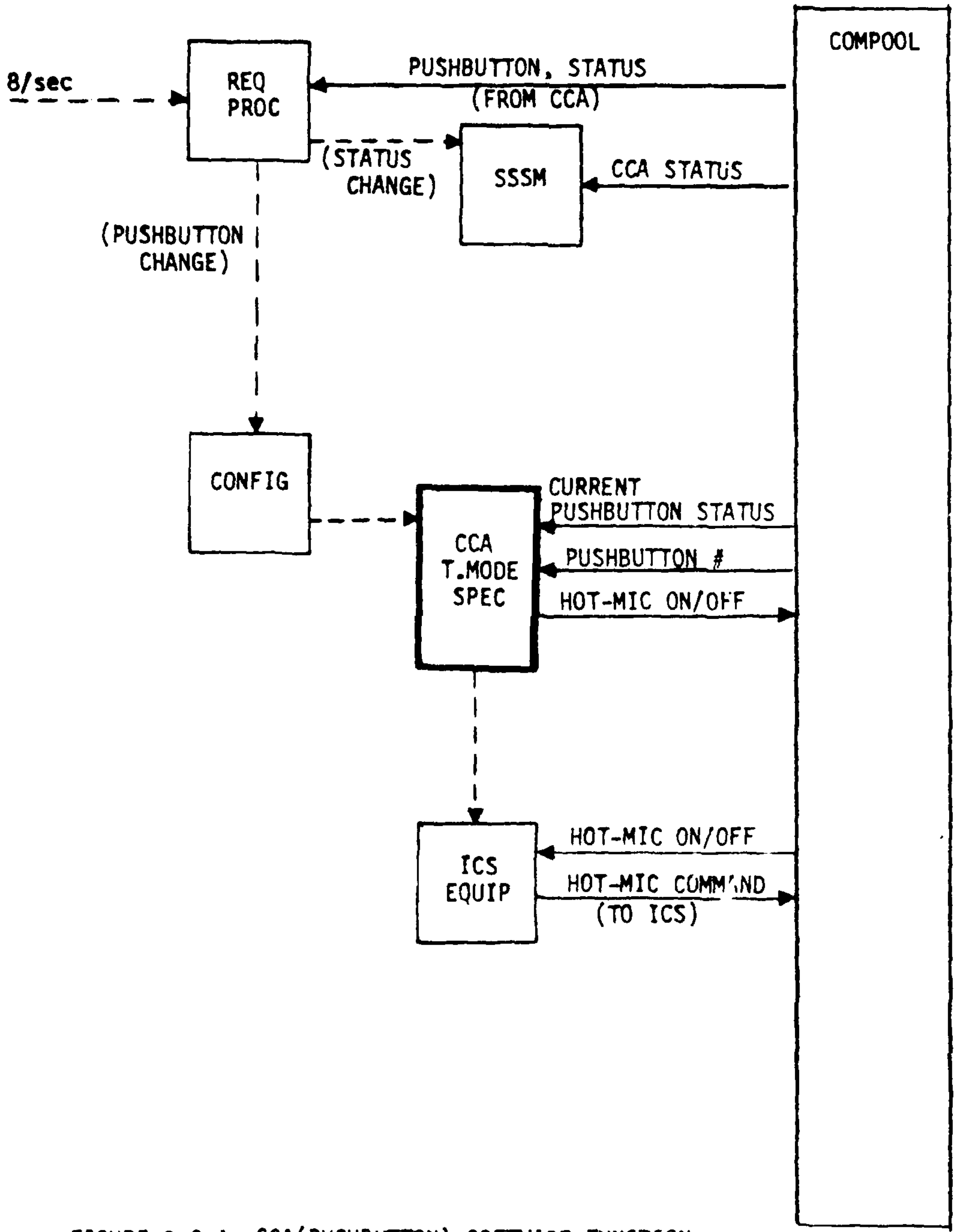


FIGURE 3.2-4 CCA(PUSHBUTTON) SOFTWARE FUNCTION

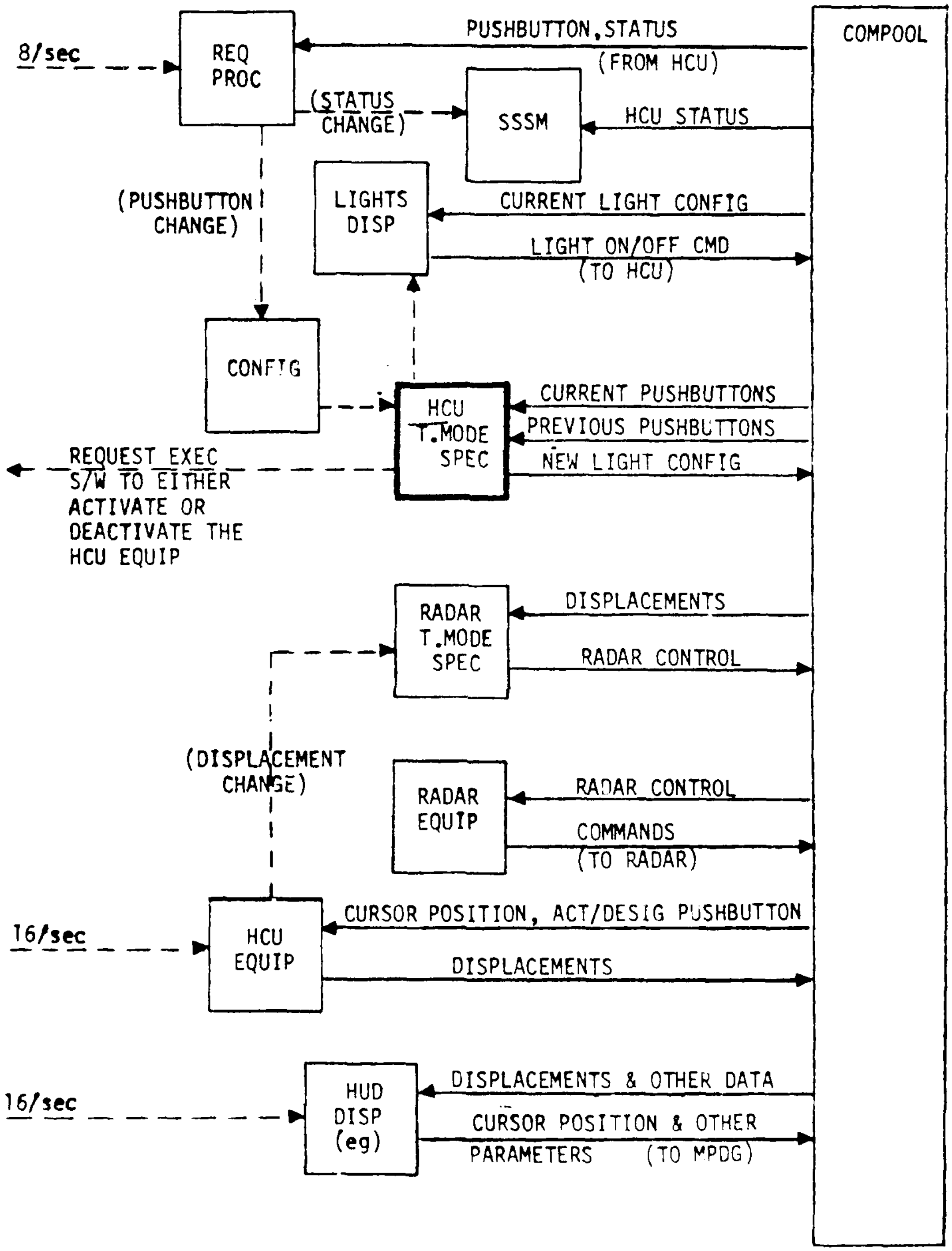


FIGURE 3.2-5 HCU SOFTWARE FUNCTION

AD-A083 113   BOEING AEROSPACE CO SEATTLE WA BOEING MILITARY AIRPL--ETC   F/G 9/2
COMPUTER PROGRAM DEVELOPMENT SPECIFICATION FOR IDAMST OPERATION--ETC(U)
NOV 76   F33615-76-C-1099
UNCLASSIFIED   SPEC-SB-4042   AFAL-TR-76-208-ADD-2   NL

2 OF 3
AD
A083 113

3.2.3.3.4.1 Inputs

Input shall consist of

- o pushbutton number (1 word)
- o pushbutton status (1 word)

3.2.3.3.4.2 Processing

When activated by the configurator, this function shall determine whether the pushbutton input represents a change in the current status from off-to-on. If so, it shall:

- o request cyclic activation of the HCU EQUIP (if inactive)
- o activate the LIGHTS DISP to command the proper light configuration

If the pushbutton input indicates a change in the current status from on-to-off, the HCU Tailored Mode SPEC shall

- o request deactivation of the HCU EQUIP (if active)
- o activate the LIGHTS DISP to turn off the light

3.2.3.3.4.3 Outputs

Output shall consist of

- o light on/off configuration (1 word)

3.2.3.4 Handler Specialist Functions

Handler Specialist Functions control processing for crew-IMK/DEK and crew-MPD/DEK interfaces. They provide the logic to control the display pages associated with the particular device.

There are always two Handler SPECS active: One for the IMK and one for the MPD (for checklist processing).

3.2.3.4.1 IMK Handler SPEC

The IMK Handler SPEC controls processing for all IMK display pages. It is scheduled by the configurator and activated by the request processor (for side key inputs) or by the DEK input EQUIP.

3.2.3.4.1.1 Inputs

Input shall consist of

- o IMK side key number (1 word)
- o table of control information for the page (10 x 2 words)

3.2.3.4.1.2 Processing

When activated by the request processor because of a side key, the IMK Handler Specialist Function shall determine from the display control information whether:

- o DEK input is required
- o a Tailored Mode SPEC should be activated
- o the current OPS or Brute-Force SPEC should be activated to change displays

If DEK input is required for the specific side key number, the IMK Handler shall request cyclic activation of the DEK input EQUIP and displays a symbol on the IMK indicating that DEK input is required. If DEK input is not required for the side key number (and a new display is not requested), the IMK Handler shall activate the appropriate Tailored Mode SPEC. If the side key number is a request for a new display page (advance to lower level, return to higher level), the current OPS or Brute-Force SPEC task shall be notified. (If the DEK EQUIP is active when a side key input is received, it shall be deactivated.)

When activated by the DEK EQUIP, the IMK Handler shall activate the appropriate Tailored Mode SPEC to process the DEK input buffer, and then shall deactivate the DEK EQUIP.

The IMK Handler SPEC shall activate the request processor when the MMK backup capability is used.

3.2.3.4.1.3 Outputs

Output shall consist of:

- o IMK/MPD message ID noting that DEK input is required (1 word)
- o DEK mark control message (1 word)
- o Next display ID (1 word)

3.2.3.4.2 MPD Handler SPEC

The MPD Handler SPEC controls processing for all MPD checklist display pages. It is scheduled by the configurator and activated by the DEK input EQUIP.

3.2.3.4.2.1 Inputs

Input shall consist of:

- o DEK input buffer (n words)
- o table of control information for display page (n x 2 pages)

3.2.3.4.2.2 Processing

When activated by the DEK input EQUIP, the MPD Handler SPEC shall determine the required processing:

- o item checkoff
- o skip item
- o advance page

MPD Handler processing for item checkoff shall consist of displaying a " ✓" next to the item checked off, and then a "←" opposite the next item in the checkoff sequence.

Skip items shall advance the "←" without checking off the item.

For advance page, the MPD Handler shall activate the MPD Checklist DISP to display the next checklist page.

3.2.3.4.2.3 Outputs

Output shall consist of:

- o DEK mark control message
- o next display ID (1 word)

3.2.4 Display Processes

Display Processes (DISPS) control cockpit displays. When activated, they obtain data/signals generated by the Application Software, perform required formatting, and output the resulting data messages to compools for subsequent transmission to display hardware.

Ten Display Processes have been identified for IDAMST:

- o LIGHTS - Controls lamp on/off for the MMK, HCU, MFDC, IMK, Marker Beacon, Low Speed Warning, Ground Proximity Warning, EFCS Warning
- o INSTRUMENTS - Controls dedicated cockpit instruments: Mach, Air Speed, Vertical Velocity, Altimeter, Accelerometer
- o HUD - Controls HUD for given Master Mode
- o HSD - Controls HSD for given Master Mode
- o MPD CHECKLIST - Controls MPD checklist display pages
- o MPD PARAMETERS/STATUS - Controls processing for the various MPD functional display pages
- o ERROR/WARNING MESSAGES - Controls the outputting of error and warning messages to the crew
- o IMK FIXED TEXT - Controls the display of IMK fixed text pages
- o DEK MARK - Controls DEK check/mark processing pertaining to checklist and data input functions on MPD/IMK
- o IMK STATUS - Controls status displays output to the IMK center partition

3.2.4.1 Lights Display Process

The Lights DISP commands lamp on/off configuration for: a) control panels, b) marker beacon, and c) warning lights. It is activated by the Application Software task responsible for controlling the lamp status of the particular display device.

3.2.4.1.1 Inputs

Input shall consist of

- o device ID (1 word)
- o desired configuration (1 word)

3.2.4.1.2 Processing

The Lights DISP shall format a message to command the desired on/off configuration, and store the message in a compool to be sent to the device.

3.2.4.1.3 Outputs

Output shall consist of

- o lamp on/off command (1 word)

3.2.4.2 Instruments Display Process

The Instruments DISP updates the dedicated cockpit instruments:

- o mach and air speed indicator
- o vertical speed indicator
- o baro altitude indicator
- o g-meter

It is activated 16 times per second throughout the flight.

3.2.4.2.1 Inputs

Input shall consist of

- o flight control system data (n words)
- o minimum/maximum acceleration since reset (2 words)

3.2.4.2.2 Processing

The Instruments DISP shall obtain the input from a compool, calculate the parameters, perform scaling as required, and output the result to a compool for subsequent transfer to the instruments.

3.2.4.2.3 Outputs

Output shall consist of

- o mach number
- o air speed
- o vertical speed
- o baro altitude
- o acceleration (minimum, maximum, current)

3.2.4.3 HUD Display Process

The HUD DISP provides parameters to the MPDG for display on the HUD. It is activated 16 times per second throughout the flight except for Shutdown Mode.

3.2.4.3.1 Inputs

Input shall consist of:

- o parameter data (n words)
- o cursor position (2 words)

3.2.4.3.2 Processing

Upon activation, the HUD DISP shall calculate and/or scale those parameters required for all Master Modes. It then shall process those additional parameters required for the current Master Mode (except those purged by a declutter request). The particular parameters calculated for each Mode shall be as shown in Table 3.2-1.

3.2.4.3.3 Outputs

Output shall consist of:

- o parameters corresponding to Master Mode (n words)

3.2.4.4 HSD Display Process

The HSD DISP provides parameters to the MPDG for display on the HSD. It is activated 16 times per second throughout the flight except for Shutdown Mode.

3.2.4.4.1 Inputs

Input shall consist of:

- o parameter data (n words)
- o cursor position (2 words)

3.2.4.4.2 Processing

Upon activation, the HUD DISP shall determine if an HSI display is "assigned" to any MPD. If so, those parameters required by the MPDG to generate the HSI display shall be calculated and/or scaled.

The HUD DISP shall then determine if a MAP display is "assigned" to any MPD. If so, those parameters required by the MPDG to generate the MAP display shall be calculated and/or scaled.

The parameter/functions provided by the MPDG shall consist of:

<u>HSI</u>

distance to waypoint
time to go
heading and heading annunciator
bearing pointers (2)
bearing identifiers

TABLE 3.2-1: HUD PARAMETERS

HUD	START	TAKE OFF	ENROUTE	AIR REFUEL	AIR DROP	TA/TF	LAPES	LAND	GO AROUND	SHUT DOWN	TEST
HEADING	•	•	•	•	*	*	*	•	•		•
ATTITUDE (ROLL)	•	•	•	•	•	*	•	•	•		•
(PITCH)	•	•	•	•	•	•	•	•	•		•
VELOCITY VECTOR	•	*	•		•	•	•	•	*		•
DIRECTOR INFO	•	*	*		•	•	•	•	*		•
AIRSPEED	•	•	*	•	*	*	*	•	•		•
ALTITUDE (BARO)	•	•	*	•	*	•	•	•	•		•
(RADAR)	•	•			*	*	*	•	•		•
WARNING INFO	•	•	•	•	•	•	•	•	•	•	•
VERTICAL VELOCITY	*	*	•	•	*		*	*	*		•
SPEED ERROR	*	*	*	•	*	*	•	*	*		•
LIMIT BOX (GS/LOC)	*							*	*		•
COMMAND INDEX	*	*	*		*		*	*	*		•
TARGET DESIGNATOR	*		*	•	•						•
FALL LINE	*				•						•
CCIP	*				•						•
CARGO RELEASE CUE	*				•		•				•
TERRAIN CONTOUR	*					•					•
CURSOR	*										

• DISPLAY
* DELETE VIA DECLUTTER SW

HSI (Continued)

selected heading
selected course
to-from
deviation
vertical deviation path pointer
vertical track change alert
lateral track change alert
offset annunciator
nav. mode annunciator
heading warn
navigation warn

MAP

map scale
way points
navaids
key elevations
projected A/C position
"killer" data
alternate track
airport/target location
(cursor position)

3.2.4.4.3 Outputs

Output shall consist of

- o HSI display parameters (n words)
- o MAP display parameters (n words)

3.2.4.5 MPD Checklist Display Process

The MPD Checklist DISP displays requested checklists. It is activated by the MPD Handler Specialist Function whenever a checklist is to be displayed on an MPD.

3.2.4.5.1 Inputs

Input shall consist of

- o device identification (1 word)
- o checklist identification (1 word)

3.2.4.5.2 Processing

The MPD checklist DISP shall format the MPDG message for displaying the specified checklist on the specified MPD.

3.2.4.5.3 Outputs

Output consists of a control message:

- o MPDG control (1 word)

3.2.4.6 MPD Parameters/Status Display Process

The MPD Parameters/Status DISP controls the various MPD displays. It is activated once per second.

Table 3.2-6 gives the Display numbers which can be displayed on each MPD (e.g., Display #3 can only be shown on MPD #3). Tables 3.2-2 and 3.2-3 show the normal display configuration at the start of a given mission mode. Figure 3.2-6 is an example of a combined nav/comm display page.

3.2.4.6.1 Inputs

Input shall consist of:

- o display requests (2 words)
- o display status (3 words)
- o parameter status (n words)

3.2.4.6.2 Processing

Displays are changed via IMK request; the IMK Handler SPEC processes and stores these requests. At each activation, the MPD Parameters/Status DISP shall check the requests and update the MPD display status (Display number versus MPD number) table.

The DISP shall then obtain the current status for the parameters contained in the up-to-three displays and store them in a Compool for later transfer to the MPDG.

3.2.4.6.3 Outputs

Output shall consist of a) an output buffer to the MPDG containing display ID and parameter status for each and b) updated display status:

- o MPDG data buffer (n words)
- o display status (3 words)

3.2.4.7 Error/Warning Display Process

The Error/Warning DISP controls the outputting of MPD error and warning messages. It is activated by the task which either detects the error or determines the severity of the warning. The messages normally appear on the bottom two lines of the center MPD.

Display	MPD #1 Pilot	MPD #3	MPD #2 Copilot
Nav Status	√		√
Comm Status	√		√
System Status		√	
Engine Parameters		√	
Departure Area Data	√		
Take Off Parameters			√
Cruise Parameters			√
Refuel Status		√	
Air Drop Flight Parameters	√		√
Air Drop Area Data	√		
Approach Data	√		
Landing Area Data	√		
Weight and Balance Data		√	
Weight and Fuel Data		√	
Flare Inventory		√	
Low Speed Parameters			√
Aircraft Systems Readout		√	
Warning/Caution		√	
Flight Data	√		
LAPES Area Data	√		
Rendezvous Data	√		
SID	√		
STAR	√		
Delivery System Status		√	

TABLE 3.2-2 NOMINAL DISPLAY VERSUS MPD ASSIGNMENT

TABLE 3.2-3 NORMAL DISPLAYS AT BEGINNING OF MODE

MASTER MODE	MPD #1 PILOT*	MPD #3 CENTER	MPD #2 COPILOT*
START	-	ENGINE PARAMETERS	-
TAKEOFF	NAV STATUS DEPARTURE AREA DATA	ENGINE PARAMETERS	COMM STATUS TAKEOFF PARAMETERS
ENROUTE	NAV STATUS	ENGINE PARAMETERS	CRUISE PARAMETERS COMM STATUS
AIR DROP	FLIGHT DATA AIR DROP PARAMETERS	AREA DATA ENGINE PARA. DELIVERY SYS. STATUS	NAV STATUS COMM STATUS
LAPES	FLT DATA APPR DATA LAPES AREA DATA	ENGINE PARAMETERS DELIVERY SYS. STATUS	NAV STATUS COMM STATUS
AIR REFUEL	FLT DATA RENDEZVOUS DATA	ENGINE PARAMETERS AIR REFUEL SYS STATUS	NAV STATUS COMM STATUS
TF/TA	-	ENGINE PARAMETERS	NAV STATUS COMM STATUS
GO AROUND	FLIGHT DATA, SID LANDING AREA DATA	ENGINE PARAMETERS	NAV STATUS COMM STATUS
LAND	APPROACH DATA, STAR LANDING AREA DATA	ENGINE PARAMETERS	NAV STATUS COMM STATUS
SHUTDOWN	-	ENGINE PARAMETERS A/C SYSTEMS READOUT	-
GROUND TEST	-	-	-

* MODE-ORIENTED CHECKLISTS SHALL ALSO APPEAR AUTOMATICALLY AT BEGINNING OF MODE.

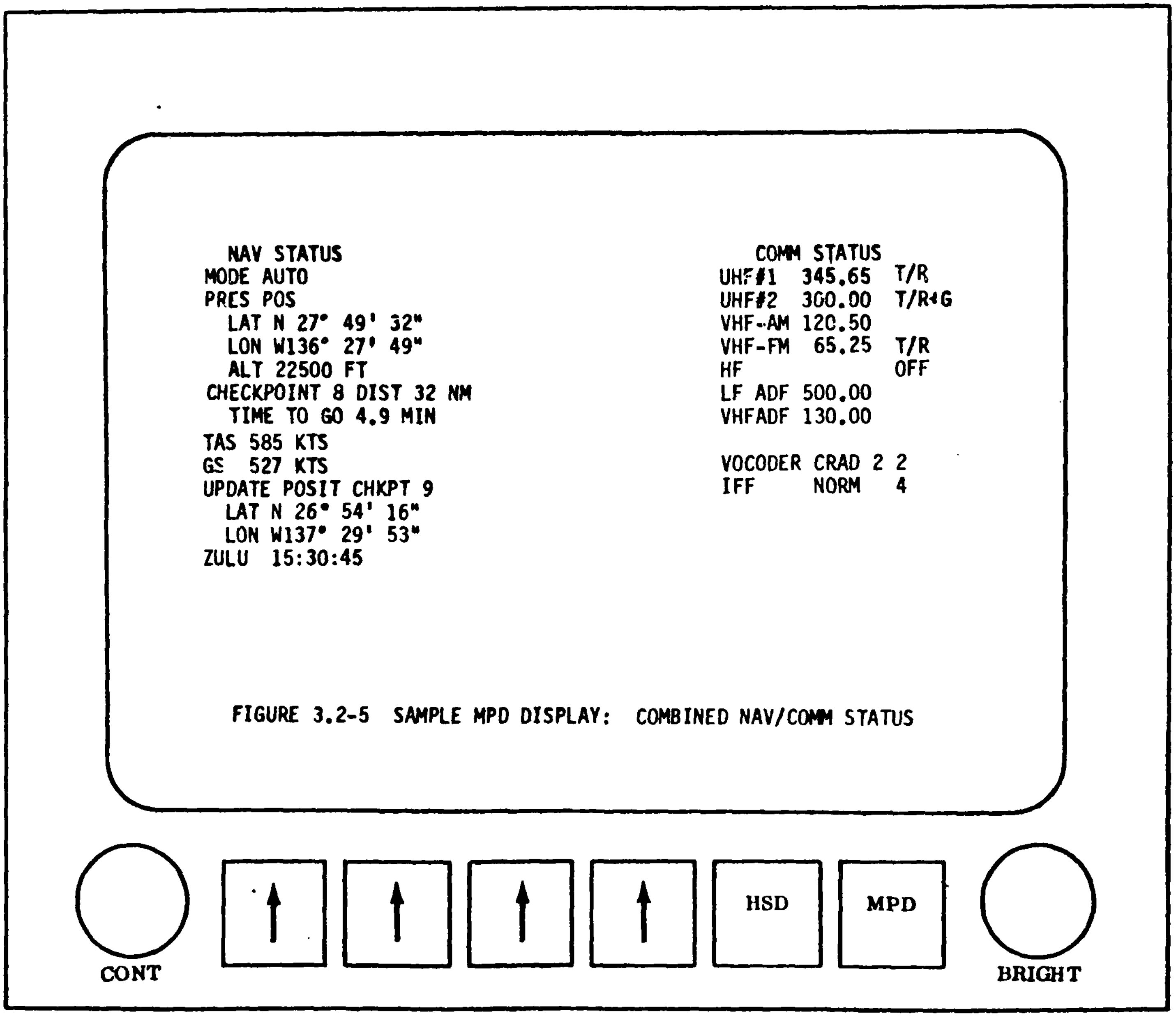


FIGURE 3.2-5 SAMPLE MPD DISPLAY: COMBINED NAV/COMM STATUS

3.2.4.7.1 Inputs

Input shall consist of

- o message number (1 word)

3.2.4.7.2 Processing

Using the input identifier, the Error/Warning DISP shall obtain the message from a compool and add current status, if necessary.

3.2.4.7.3 Outputs

Output shall consist of

- o error/warning message (n words)

3.2.4.8 IMK Fixed Text Display Process

The IMK Fixed Text DISP controls the display of fixed-formatted pages on the IMK. It is activated by an Operational Sequencer or Brute Force Specialist Function wherever a new IMK page is to be displayed. Figure 3.2-7 shows a sample IMK Fixed-Text display.

3.2.4.8.1 Inputs

Input shall consist of

- o page number (1 word)

3.2.4.8.2 Processing

This function shall format a message containing the page ID, and store it for transfer to the A/NSG. The actual "pages" are pre-stored in the A/NSG.

3.2.4.8.3 Outputs

Output shall consist of

- o page number (1 word)

3.2.4.9 DEK Mark Display Process

The DEK Mark DISP provides the capability to add a symbol to a specified line on the IMK or MPD indicating required action, and to delete the symbol when the action has been completed.

The symbol may be a "d" on the IMK to denote required DEK input, which is then removed when valid DEK input is entered. The symbol may be a "✓" on the MPD to denote a checked off item or a "⟵" to denote the next item in a checkoff sequence.

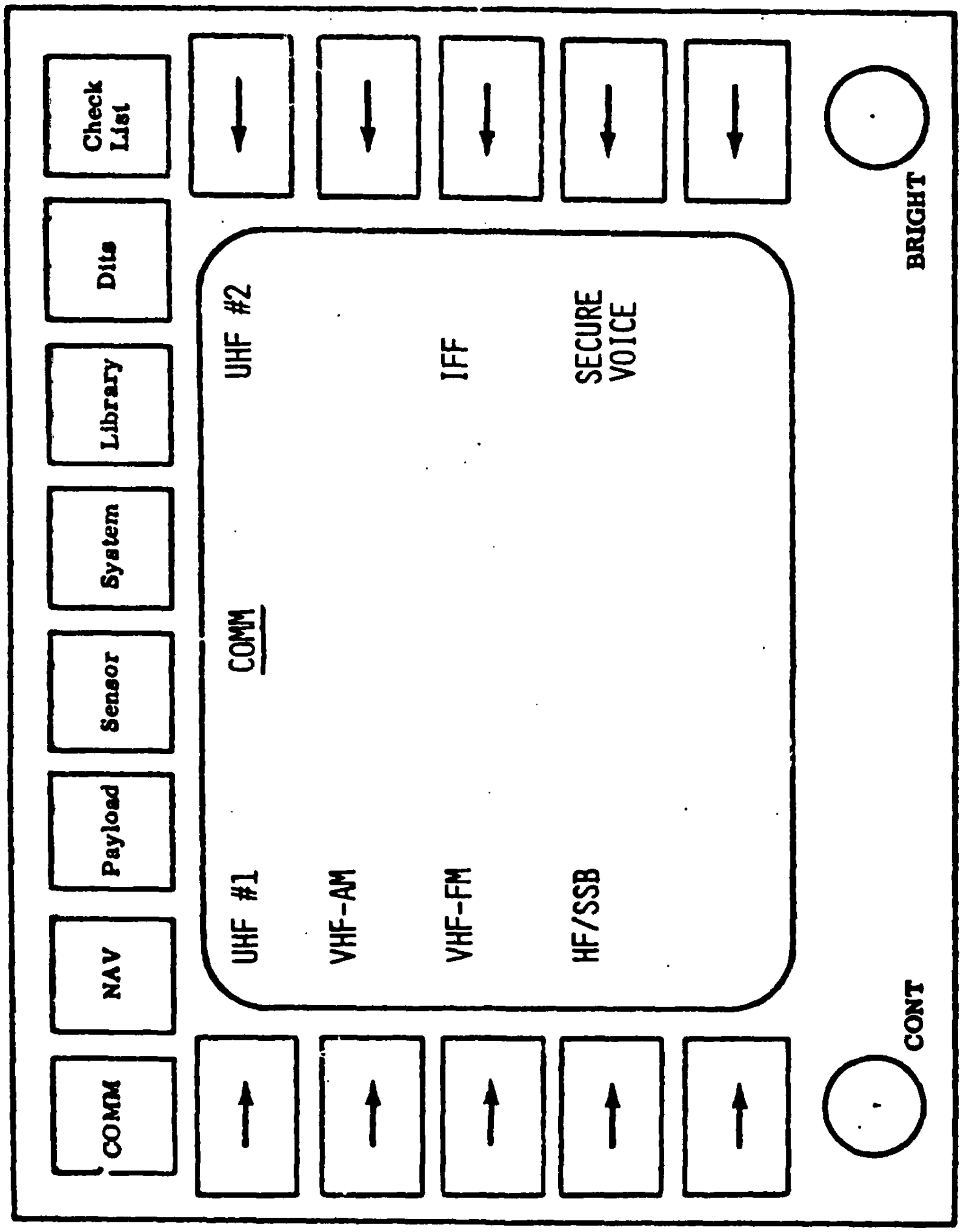


FIGURE 3.2-7 SAMPLE IMK FIXED - TEXT DISPLAY

It is usually activated by the IMK or MPD Handler Specialist Function to control the symbol display. It is sometimes activated by a Tailored Mode SPEC which determines the successful completion of a data entry.

3.2.4.9.1 Inputs

Input shall consist of:

- o device number (1 word)
- o action - insert, delete (1 word)
- o CRT row, column (1 word)

3.2.4.9.2 Processing

Given the device and requested action, the DEK Mark DISP shall store the appropriate message in a Compool to be sent to the A/NSG or MPDG.

3.2.4.9.3 Outputs

Output shall consist of the A/NSG or MPDG message:

- o control message (1 word)

3.2.4.10 IMK Status Display Process

The IMK Status DISP controls the display of status information in the center partition of the IMK. It is activated once per second to update parameter status if there is an active display. Figure 3.2-8 shows a sample IMK status display.

3.2.4.10.1 Inputs

Input shall consist of the status display ID:

- o display number (1 word)

3.2.4.10.2 Processing

The IMK Status DISP shall access a table which identifies the parameters for the display number. Current status for these parameters shall be obtained from a Compool, formatted and stored in an output buffer for transfer to the A/NSG.

3.2.4.10.3 Outputs

Output shall consist of the A/NSG buffer:

- o parameter status (n words)

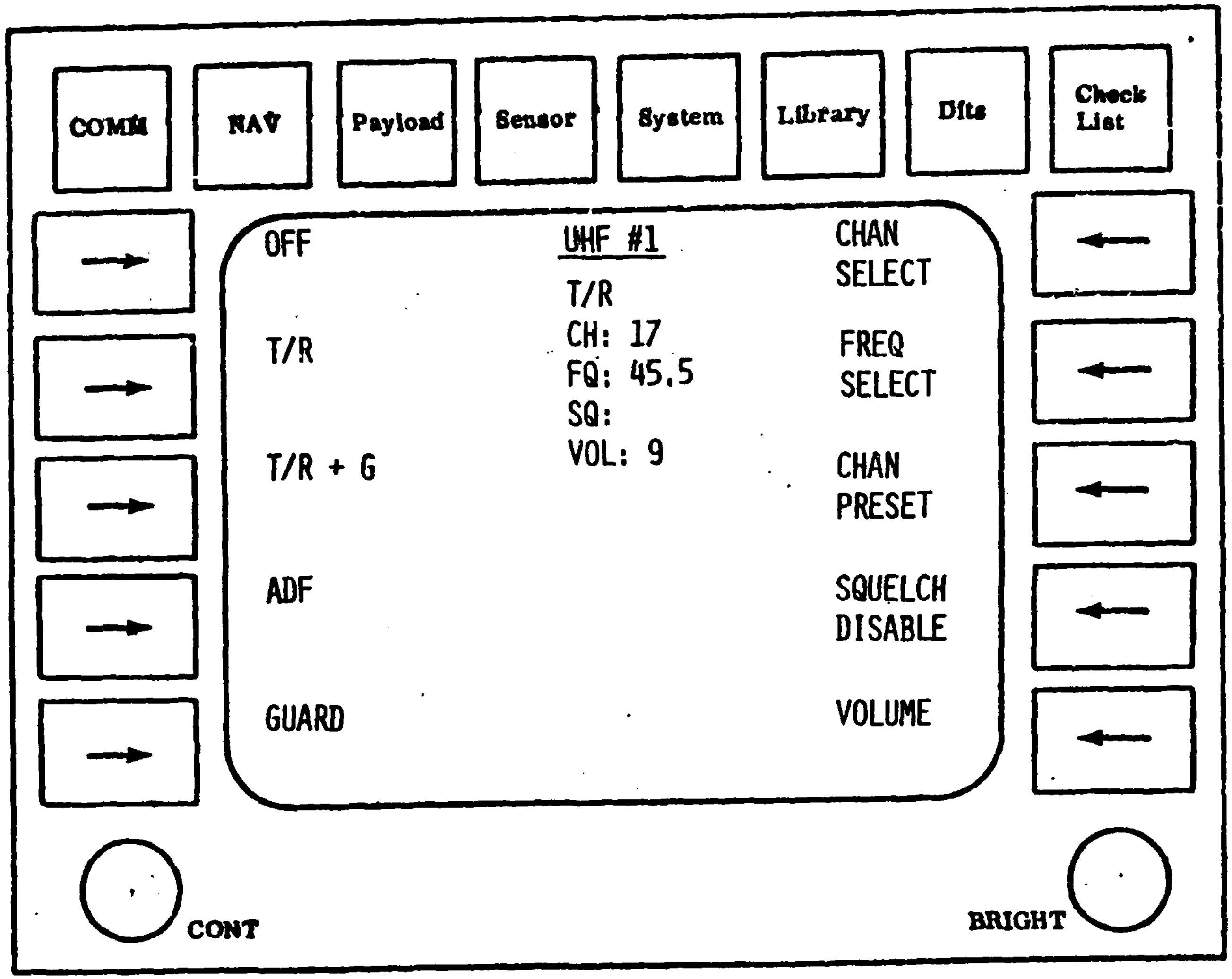


FIGURE 3.2-8 SAMPLE IMK STATUS DISPLAY

3.2.5 Equipment Processes

The Applications Software interfaces with IDAMST equipment via Equipment Processes (EQUIPS).

For each sensor providing data to the Application Software, the corresponding input EQUIP will:

- o monitor equipment status and initiate action when a health problem or degraded data is detected
- o perform the processing required to make the parameter(s) available for use by Applications Software tasks
- o generate substitute data values if necessary

Those EQUIPS which output control data to equipment will:

- o perform the processing required to format the appropriate control message

The Equipment Processes identified for IDAMST are shown in Table 3.2-4.

3.2.5.1 UHF-AM Equipment Process

The two UHF-AM radios (AN/ARC-164) are used for military communications and as backup ADF receivers. They provide short-range, line-of-sight, two-way simplex voice communication with ground systems and other aircraft, operating in the 225-399.95 mHz frequency band. When the radio is in backup ADF mode, bearing is obtained via the ADF EQUIP.

The UHF EQUIP is activated by the UHF-AM Tailored Mode SPEC whenever a formatted control message is to be sent to the radio.

3.2.5.1.1 Inputs

Input shall be a message containing radio ID and desired control:

- o radio ID, control input (2 words)

Control capability consists of one of the following:

- o frequency channel pre-set, alligning frequency tuning by channel select
- o manual frequency selection
- o pre-set guard frequency selection
- o operational mode selction (T/R, TR+G, ADF, OFF)

TABLE 3.2-4 EQUIP SUMMARY

Equipment	Activation Rate (per second)	
DEK	8*	(Input)
TACAN	8	(Input)
HCU	16*	(Input)
OMEGA	8	(Input)
FCS	32	(Input)
G-Meter	4	(Input)
INS	4	(Input)
SKE/ZM	4	(Input)
LF/ADF	4	(Input)
UHF/ADF	4	(Input)
Radar ALT	4	(Input)
ILS	4	(Input)
Compass	4	(Input)
Flight Surfaces	2	(Input)
Aircraft Systems	2	(Input)
Caut/Brakes/Gear	2	(Input)
UHF-AM	Demand	(Output)
VHF-AM	Demand	(Output)
VHF-FM	Demand	(Output)
HB/SSB	Demand	(Output)
DSMU	Demand	(Output)
Secure Voice	Demand	(Output)
TACAN	Demand	(Output)
OMEGA	Demand	(Output)
CCA	Demand	(Output)
FCS	16	(Output)
Flares	Demand	(Output)
INS	Demand	(Output)
SKE/ZM	Demand	(Output)
LF/ADF	Demand	(Output)
UHF/ADF	Demand	(Output)
Radar ALT	Demand	(Output)
ILS	Demand	(Output)
Compass	Demand	(Output)
Radar	Demand	(Output)
IRD&W	Demand	(Output)
RHAWS	Demand	(Output)
Avionics On/Off	Demand	(Output)
ICS	8	(Input/Output)
P.A.	8	(Input/Output)
FDR	TBD	(Output)

* Continuous activation only when being used.

o squelch disable

o volume control

3.2.5.1.2 Processing

When activated by the UHF-AM Tailored Mode SPEC, the EQUIP shall determine the type of control desired, format the required message, and store it in a compool for subsequent transfer to the radio. Input control data will have been checked by the activating task for invalid/out-of-range conditions, sc EQUIP processing shall assume valid data.

3.2.5.1.3 Outputs

Output shall be control messages corresponding to the request, and status updates:

o control command (1 word)

o status update (1 word)

3.2.5.2 VHF-AM Equipment Process

The VHF-AM radio (Wilcox-807A) is used for CCT and civilian communications. It provides two-way simplex 160 nautical mile voice communication in the 118 - 135.975 mHz frequency band over line-of-site propagation paths.

The VHF-AM EQUIP is activated by the VHF-AM Tailored Mode SPEC whenever a formatted control message is to be sent to the radio.

3.2.5.2.1

Input shall be a message containing the desired control:

o control input (1 word)

Control capability consists of one of the following:

o manual frequency selection

o squelch disable

o volume control

o on/off control

3.2.5.2.2 Processing

When activated by the VHF-AM Tailored Mode SPEC, the EQUIP shall determine the type of control desired, format the required message, and store it in a compool for subsequent transfer to the radio. Input control data will have been checked by the activating task for invalid/out-of-range conditions, so EQUIP processing shall assume valid data.

3.2.5.2.3 Outputs

Output shall be control messages corresponding to the request, and status updates:

- o control command (1 word)
- o status update (1 word)

3.2.5.3 VHF-FM Equipment Process

The VHF-FM radio (FM622A) is used primarily for military/CCT communications. It provides short-range line-of-sight, two-way simplex voice communication in the 30 - 75.95 mHz frequency range.

The VHF-FM EQUIP is activated by the VHF-FM Tailored Mode SPEC whenever a formatted control message is to be sent to the radio.

3.2.5.3.1

Input shall be a message containing the desired control:

- o control input (1 word)

Control capability consists of one of the following:

- o on/off control
- o manual frequency selection
- o volume control
- o T/R control
- o re-transmit control
- o home control
- o squelch disable
- o squelch carrier
- o squelch tone

3.2.5.3.2 Processing

When activated by the VHF-FM Tailored Mode SPEC, the EQUIP shall determine the type of control desired, format the required message, and store it in a compool for subsequent transfer to the radio. Input control data will have been checked by the activating task for invalid/out-of-range conditions, so EQUIP processing shall assume valid data.

3.2.5.3.3 Outputs

Output **shall be** control messages corresponding to the request, and status updates:

- o control command (1 word)
- o status update (1 word)

3.2.5.4 HF/SSB Equipment Process

The HF/SSB radio (AN/ARC-123) is used for long-range military communications. It provides two-way simplex voice communications at distances up to 2,500 nautical miles, operating in the 2 - 30 mHz frequency band.

The HF/SSB EQUIP is activated by the HF/SSB Tailored Mode SPEC whenever a formatted control message is to be sent to the radio.

3.2.5.4.1

Input **shall be** a message containing the desired control:

- o control input (1 word)

Control capability consists of one of the following:

- o on/off control
- o manual frequency selection
- o SSB
- o amplitude modulation equivalent
- o frequency shift key
- o continuous wave
- o volume control
- o squelch disable
- o noise blank
- o RF gain control

3.2.5.4.2 Processing

When activated by the HF/SSB Tailored Mode SPEC, the EQUIP **shall** determine the type of control desired, format the required message, and store it in a compool for subsequent transfer to the radio. Input control data will have been checked by the activating task for invalid/out-of-range conditions, so EQUIP processing **shall** assume valid data.

3.2.5.4.3 Outputs

Output shall be control messages corresponding to the request, and status updates:

- o control command (1 word)
- o status update (1 word)

3.2.5.5 ICS Equipment Process

The Intercommunication Set (AN/AIC-18) provides:

- o two-way voice communication between crew stations
- o interfaces with radio tranceivers, navigation receivers, public address amplifier, and maintenance intercom outlets

The ICS allows for selection, control, and distribution of radio systems for airborne/ground station communication and monitoring.

The ICS EQUIP is activated cyclically eight times per second from startup.

3.2.5.5.1 Inputs

Input shall be ICS control panel ID and settings, and hot-mic select from the CCA:

- o hot-mic selection (CCA) (1 word)
- o monitoring (mixer) switches with individual volume controls (n words)
- o hot-listen selection (1 word)
- o mic-talk selection (panel) (1 word)
- o call selection (1 word)
- o aux listen selection (1 word)

3.2.5.5.2 Processing

The EQUIP shall determine if panel setting has changed since the last activation. If the settings are the same, the EQUIP shall terminate. If changed, the EQUIP shall format/store corresponding ICS control messages.

3.2.5.5.3 Outputs

Output shall be control messages corresponding to the request, and status updates:

o control command (1 word)

o status update (1 word)

3.2.5.6 Public Address Equipment Process

The P.A. System (AN/AIC-13) is used for voice announcements in the cargo areas.

The P.A. EQUIP is activated cyclically eight times per second from startup.

3.2.5.6.1 Inputs

Input shall be the P.A. control panel output buffer to be monitored by the EQUIP:

o on/off control

o speaker selection

o mixer switch control

o volume control

3.2.5.6.2 Processing

The EQUIP shall determine if panel setting has changed since the last activation. If the settings are the same, the EQUIP shall terminate. If changed, the EQUIP shall format/store corresponding P.A. control messages.

3.2.5.6.3 Outputs

Output shall be control messages corresponding to the request, and P.A. status updates:

o control command (1 word)

o status update (1 word)

3.2.5.7 Secure Voice Equipment Process

The Secure Voice System (TSEC/KY-58) encrypts and decrypts VHF/UHF voice communication.

The secure voice EQUIP is activated by the Secure Voice Tailored Mode SPEC whenever on/off control is to be sent to the unit.

3.2.5.7.1 Input

Input shall be a message containing desired control:

o on/off indication (1 word)

3.2.5.7.2 Processing

This EQUIP shall store the on (or off) control message in a compool for subsequent transfer to the unit.

3.2.5.7.3 Outputs

Output shall be control messages corresponding to the request, and status updates:

- o control command (1 word)
- o status update (1 word)

3.2.5.8 DEK Equipment Process

The DEK Equipment Process controls the DEK input procedure. An eight-times-per-second activation rate is initiated by a Handler Specialist Function whenever DEK input is required for a particular IMK side key function or MPD checklist function. It is deactivated when an ENTER is received or when there is no further need for the input.

3.2.5.8.1 Inputs

Input shall be one character:

- o character (1 word)

which may represent any of the following:

- o digits 0 through 9
- o CLEAR (re-set)
- o CHECK (checklist checkoff - MPD)
- o SPACE (checklist skip function - MPD)
- o PAGE (advance page - MPD)
- o ENTER (end-of-data)
- o NULL (no input)

3.2.5.8.2 Processing

When activated, the DEK EQUIP shall initialize the input buffer. Each activation thereafter (eight/second) the EQUIP shall determine input status, and terminate if there was no input since the last activation.

If the input was a 0 - 9 digit (or its upper case equivalent), and the input buffer isn't full, the character shall be stored; otherwise, the buffer shall be cleared and a message displayed on the center MPD via the Error/ Warning DISP. The maximum size of the input buffer is $\boxed{20}$ characters.

If the input is CLEAR, the EQUIP shall clear the buffer.

CHECK, SPACE, PAGE are used for MPD checklist functions; the MPD Handler Specialist Function is activated to control the processing of the input buffer. If the DEK EQUIP is assigned to an IMK Handler, these keys shall be ignored.

ENTER indicates the end of the input data string; the Handler Specialist Function shall be activated to process the input buffer.

3.2.5.8.3 Outputs

Output shall be the final DEK input buffer:

- o input buffer (1 - n word)

packed two characters per word.

3.2.5.9 DSMU Equipment Process

The DSMU controls display distribution and refresh functions. It contains modules which provide five independent raster memory channels to refresh the MPD's, and two independent stroke channels for the HUD's. The display memory is loaded/updated from the MPDG. Switching commands allow sensor video to be displayed in lieu of a display stored in a memory module.

The DSMU EQUIP is activated by the DSMU Tailored Mode SPEC whenever a switching command is to be sent to the DSMU as a result of a crew request via the IMK.

3.2.5.9.1 Inputs

Input shall consist of

- o DSMU switching request (1 word)

3.2.5.9.2 Processing

The DSMU EQUIP shall format the switching command and store in an output buffer for transfer to the DSMU.

3.2.5.9.3 Outputs

Output shall consist of

- o DSMU switching command (1 word)
- o Switching status (1 word)

3.2.5.10 TACAN Equipment Processes

The TACAN System (AN/ARN-118) furnishes data relative to a selected TACAN facility operating in the 962 - 1213 mHz frequency band.

Two TACAN EQUIPS are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats TACAN commands to satisfy control requests.

3.2.5.10.1 TACAN Input EQUIP

This EQUIP processes data from the TACAN system. It is activated eight times per second.

3.2.5.10.1.1 Inputs

Input shall be TACAN data and previous status:

- bearing (1 word)
- range (1 word)
- range rate, to-from indication (1 word)
- status (1 word)
- previous status (1 word)

3.2.5.10.1.2 Processing

The input EQUIP shall format and scale the data as necessary, and store the results in a compool. If status has changed, the SSSM shall be activated.

3.2.5.10.1.3 Outputs

Output shall be the formatted data:

- bearing (1 word)
- distance (1 word)
- range rate (1 word)
- to-from indicator (1 word)
- course deviation signal (1 word)

3.2.5.10.2 TACAN Output EQUIP

This EQUIP formats control messages to the TACAN. It is activated by the TACAN Tailored Mode SPEC whenever control is requested by a crew member via the IMK.

3.2.5.10.2.1 Inputs

Input shall be control type/value data:

- o on/off
- o channel select
- o mode select
  - o receive
  - o transmit/receive
  - o A/A receive
  - o A/A transmit
- o auto/manual tuning
- o volume
- o course select
- o test capability

3.2.5.10.2.2 Processing

The input EQUIP shall generate the control message corresponding to the type/value input data.

3.2.5.10.2.3 Outputs

Output shall be the control message and status:

- o TACAN control (1 word)
- o Control status update (1 word)

3.2 5.11 HCU Equipment Process

The Hand Controller Unit provides crew memebers with: 1) the capability to point the radar antenna and 2) data update capability via display cursor positioning.

The HCU EQUIP is activated 16 times per second (whenever an HCU display-select pushbutton is in effect) to process cursor displacements.

3.2.5.11.1 Inputs

Input shall be activate/designate pushbutton and X, Y displacement:

- o pushbutton (1 word)
- o $\Delta X, \Delta Y$ (2 words)

3.2.5.11.2 Processing

The HCU EQUIP shall keep track of the "null", "activate", or "designate" state of the controller pushbutton. The state is initially "null". No calculations are performed until the controller pushbutton is pressed for the first time, changing the state to "activate".

When the state is "activate", the EQUIP shall evaluate the effective cursor position with respect to the selected display, and store these displacements for use by the particular DISP that is to use them. If the antenna control pushbutton is active, and the displacements represent a change from the previous, the Radar Tailored Mode SPEC shall be activated.

When the controller pushbutton is pressed a second time, the state changes to "designate" and no further calculations are performed; the last calculated displacement is left in a compool to be used, for example, in a navigation data update procedure.

3.2.5.11.3 Outputs

Output shall consist of displacement data and pushbutton state:

- $\triangle X$, $\triangle Y$ (2 words)
- state - null, activate, designate (1 word)

3.2.5.12 OMEGA Equipment Processes

The OMEGA Radio Navigation System (AN/ARN-) provides airplane position fixes using the worldwide network of VLF ground transmitters.

Two OMEGA EQUIPS are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats OMEGA commands to satisfy control requests.

3.2.5.12.1 OMEGA Input EQUIP

This EQUIP processes data from the OMEGA system. It is activated eight times per second.

3.2.5.12.1.1 Inputs

Input shall consist of:

- three channels of RF information

3.2.5.12.1.2 Processing

The OMEGA input EQUIP shall format/scale RF data as necessary, and store in a compool for use in navigation calculations.

3.2.5.12.1.3 Outputs

Output shall be the OMEGA parameters, properly formatted and scaled, to be stored in a compool:

- o parameters (n words)

3.2.5.12.2 OMEGA Output EQUIP

This EQUIP formats control messages to the OMEGA system. It is activated by the OMEGA Tailored Mode SPEC whenever control is requested by a crew member via the IMK.

3.2.5.12.2.1 Inputs

Input shall consist of

- o On/Off (1 word)
- o Auto/Manual Tuning (1 word)
- o GMT, Date, Latitude, Longitude (4 words)

3.2.5.12.2.2 Processing

The output EQUIP shall generate the control message corresponding to the type/value input data.

3.2.5.12.2.3 Outputs

Output shall be the control message and status.

- o OMEGA Control (1 word)
- o Status Update (1 word)

3.2.5.13 CCA Equipment Process

The Column Control Assembly provides a shaker capability for imminent stall conditions.

The CCA EQUIP is activated by the FCS EQUIP whenever shaker control (on or off) is required.

3.2.5.13.1 Inputs

Input shall consist of

- o Shaker Control Request

3.2.5.13.2 Processing

The CCA EQUIP shall store the control message in a Compool for subsequent transfer to the CCA, and update the CCA status accordingly.

3.2.5.13.3 Outputs

Output shall be control commands and status updates.

- o CCA Shaker On/Off Control (1 word)
- o On/Off Status (1 word)

3.2.5.14 FCS Equipment Process

The Flight Control System provides air data, attitude, and mode and status information. This information is processed by the avionics system to provide steering data for the flight control system.

Two FCS EQUIP's are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP is activated cyclically to send steering data.

3.2.5.14.1 FCS Input EQUIP

The FCS input EQUIP processes data from the flight control system. It is activated 32 times per second.

3.2.5.14.1.1 Inputs

Input shall be FCS output data, and previous status.

- o Air Data (10 words), 3 channels
- o Attitude (5 words), 3 channels
- o Mode and Status (1 word), 3 channels
- o Previous Status (1 word)

3.2.4.14.1.2 Processing

The Equip shall process the data as necessary, and store the results in a Compool. If the status has changed, the SSSM shall be activated. The LIGHTS DISP shall be activated for on/off control of the EFCS Warning Light, as necessary.

Data processing may include scaling, signal source selection, smoothing, algorithm calculations, etc.

3.2.5.14.1.3 Outputs

Output shall consist of

- o Air Data (10 words)
- o Attitude Data (5 words)
- o Mode/Status (1 word)
- o EFCS Light Control (1 word)

3.2.5.14.2 FCS Output EQUIP

The FCS Output EQUIP controls the sending of steering signals to the FCS. It is activated cyclically 16 times per second.

3.2.5.14.2.1 Inputs

Input shall consist of

- o Steering Requests (4 words)

3.2.5.14.2.2 Processing

The output EQUIP shall generate the steering messages and outputs them to a Compool.

3.2.5.14.2.3 Outputs

Output shall consist of

- o Steering Signals (4 words)

3.2.5.15 Flares Dispenser System Equipment Process

The Flares Dispenser System contains four sets of flares which may be dropped as a defensive measure against infrared seeker threats.

The Flares Dispenser System EQUIP is activated by the Flares Dispenser tailored Model SPEC whenever a formatted control message is to be sent to the system.

3.2.5.15.1 Inputs

Input shall be control requests and status.

- o On/Off (1 word)
- o Flare Set # (1 word)
- o Flare Status (2 words)

3.2.5.15.2 Processing

The Flares Dispenser System EQUIP shall generate control messages and store them in a Compool for transmission. The software flare status shall be updated.

3.2.5.15.3 Outputs

Output shall be control commands to the Flares Dispenser System and status.

- o On/Off Command (1 word)
- o Flare Drop Command (1 word)
- o Current Flare Status (2 words)

3.2.5.16 G-Meter Equipment Process

The G-Meter displays 1) current vertical acceleration, 2) the low vertical acceleration since last reset, and 3) the high vertical acceleration since last reset.

The G-Meter EQUIP is activated 4 times per second to monitor the reset button.

3.2.5.16.1 Inputs

Input shall consist of

- o Reset Button Status (1 word)

3.2.5.16.2 Processing

If the reset button shows a change in status, the low vertical acceleration and high vertical acceleration shall be set equal to 1.

3.2.5.16.3 Output

Output shall be new low and high vertical acceleration values.

- o Accelerations (2 words)

3.2.5.17 INS Equipment Processes

The INS (Carousel IV) is a self-contained inertial navigation system (including a digital computer) which provides worldwide aircraft navigation entirely independent of ground communication.

Two INS EQUIP's are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats INS commands to satisfy control requests.

3.2.5.17.1 INS Input EQUIP

This EQUIP processes data from the INS. It is activated 4 times per second.

3.1.5.17.1.1 Inputs

Input shall consist of

- o Aircraft Position and Velocity (6 words)
- o Pitch and Roll (2 words)
- o Calculated Digital Data (n words)
- o Status (1 word)

3.2.5.17.1.2 Processing

The EQUIP shall format and scale the data as necessary, and store the results in a Compool. If the status has changed, the SSSM shall be activated.

3.2.5.17.1.3 Outputs

Output shall consist of

- o Position and Velocity (2 words)
- o Pitch and Roll (2 words)
- o Other Data (n words)

3.2.5.17.2 INS Output EQUIP

This EQUIP formats control messages to the INS. It is activated by the INS Tailored Mode SPEC whenever control is requested by a crew member via the IMK.

3.2.5.17.2.1 Inputs

Input shall consist of

- o Mode (1 word)
- o Auto/Manual Select (1 word)
- o Initial Position (2 words)
- o Way Point Loading (n words)

3.2.5.17.2.2 Processing

The EQUIP shall generate the control message corresponding to the type/value input data.

3.2.5.17.2.2. Outputs

Output shall be the control message and updated control status:

- o INS Control (1 word) and Status (1 word)

3.2.5.18 SKE/ZM Equipment Processes

The Station Keeping Equipment (AN/APN-169) is a cooperative air-to-air station keeping system for flights of up to 36 aircraft. It enables these aircraft to locate and identify one another; and to maintain formation/rendezvous regardless of visibility. The SKE interfaces with the MDSC to provide a formation display.

Two SKE EQUIP's are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats SKE commands to satisfy control requests.

3.2.5.18.1 SKE Input EQUIP

This EQUIP processes data from the SKE. It is activated 4 times per second.

3.2.5.18.1.1 Inputs

Input shall consist of

- o Aircraft Range and Bearing (n words)
- o SKE Status (1 word)

3.2.5.18.1.2 Processing

The EQUIP shall format and scale the data as necessary, and store the results in a Compool. If the status has changed, the SSSM shall be activated.

3.2.5.18.1.3 Outputs

Output shall consist of

- o Aircraft Range and Bearing (n words)

3.2.5.18.2 SKE Output EQUIP

This EQUIP formats control messages to the SKE. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.18.2.1 Inputs

Input shall be control type/value data:

- o On/Off (1 word)
- o Freq A/B (1 word)
- o In Track Offset (1 word)
- o Altitude Offset (1 word)
- o Cross-Track Offset (1 word)
- o Leader Select (1 word)
- o Proximity Warning Range (1 word)
- o Proximity Warning Tone On/Off (1 word)
- o Master-Follow Select (1 word)
- o Master Indicator (1 word)
- o BITE Test (1 word)
- o ID Function Select (1 word)
- o Range Scale (1 word)
- o Range Mark (1 word)
- o Display Centering (1 word)
- o Blanking (1 word)

3.2.5.18.2.2 Processing

The EQUIP shall generate the control message corresponding to the type/value of the input request.

3.2.5.18.2.3 Outputs

Output shall be the control message and updated control status.

- o SKE Command (1 word) and Status (1 word)

3.2.5.19 LF/ADF Equipment Processes

The LF/ADF (DF-206) provides the navigation calculation with bearing to a selected low frequency radio station.

Two LF/ADF EQUIP's are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats LF/ADF commands to satisfy control requests.

3.2.5.19.1 LF/ADF Input EQUIP

This EQUIP processes data from the LF/ADF unit. It is activated four times per second.

3.2.5.19.1.1 Inputs

Input shall consist of

- o Bearing (1 word)
- o Status (1 word)

3.2.5.19.1.2 Processing

The input EQUIP shall format and scale the bearing input data, and store it in a Compool. If the status has changed, the SSSM shall be activated.

3.2.5.19.1.3 Outputs

Output shall consist of

- o Bearing (1 word)

3.2.5.19.2 LF/ADF Output EQUIP

This EQUIP formats control messages to the LF/ADF. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.19.2.1 Inputs

Input shall be control type/value data.

- o On/Off (1 word)
- o Auto/Manual Select (1 word)
- o Frequency Select (1 word)
- o Test Select (1 word)
- o Volume (1 word)

3.2.5.19.2.2 Processing

The output EQUIP shall generate the control message correspondina to the type/value of the input request.

3.2.5.19.2.3 Outputs

Output shall be the control message and updated control status.

- o LF/ADF Command (1 word) and Status (1 word)

3.2.5.20 UHF/ADF Equipment Processes

The UHF/ADF (DF-301E) provides the navigation calculation with bearing to a selected ultra-high frequency radio station.

Two UHF/ADF EQUIP's are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats UHF/ADF commands to satisfy control requests.

3.2.5.20.1 UHF/ADF Input EQUIP

This EQUIP processes data from the UHF/ADF unit. It is activated four times per second.

3.2.5.20.1.1 Inputs

Input shall consist of

- o Bearing (1 word)
- o Status (1 word)

3.2.5.20.1.2 Processing

The input EQUIP shall format and scale the bearing input data, and store it in a Compool. If status has changed, the SSSM shall be activated.

3.2.5.20.1.3 Outputs

Output shall consist of

- o Bearing (1 word)

3.2.5.20.2 UHF/ADF Output EQUIP

This EQUIP formats control messages to the UHF/ADF. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.20.2.1 Inputs

Input shall be control type/value data.

- o On/Off (1 word)
- o Auto/Manual Select (1 word)
- o Frequency Select (1 word)
- o Test Select (1 word)
- o Volume (1 word)

3.2.5.20.2.2 Processing

The output EQUIP shall generate the control message corresponding to the type/value of the input request.

3.2.5.20.2.3 Outputs

Output shall be the control message and updated control status.

- o UHF/ADF Command (1 word) and Status (1 word)

3.2.5.21 Radar Altimeter Equipment Processes

The two Radar Altimeters (AN/APN-194) are range tracking radars which provide altitude information from 0 - 5000 feet.

Two Radar Altimeter EQUIPS are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats Radar Altimeter commands to satisfy control requests.

3.2.5.21.1 Radar Altimeter Input EQUIP

This EQUIP processes data from the Radar Altimeter. It is activated four times per second.

3.2.5.21.1.1 Inputs

Input shall consist of

- o Status (1 word)
- o Altitude (1 word)
- o Radar altimeter ID (1 word)

3.2.5.21.1.2 Processing

The input EQUIP shall format and scale the altitude input data, and store it in a Compool. If the status has changed, the SSSM shall be activated.

3.2.5.21.1.3 Outputs

Output shall consist of

- o Altitude (1 word)

3.2.5.21.2 Radar Altimeter Output EQUIP

This EQUIP formats control messages to the Radar Altimeter. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.21.2.1 Inputs

Input shall consist of

- o On/off (1 word)
- o Low altitude select (1 word)
- o ID (1 word)
- o Test select (1 word)

3.2.5.21.2.2 Processing

The output EQUIP shall generate the control message corresponding to the type/value of the input request, and store it in a Compool.

3.2.5.21.2.3 Outputs

Output shall consist of

- o radar altimeter command (1 word)

3.2.5.22 ILS Equipment Processes

The Instrument Landing System (AN/ARN-108) is used in conjunction with ground transmitting equipment and airplane flight director calculations to provide display capability for marker beacon, glideslope, and localizer signals.

Two ILS EQUIPS are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats ILS commands to satisfy control requests.

3.2.5.22.1 ILS Input EQUIP

This EQUIP processes data from the ILS unit. It is activated four times per second.

3.2.5.22.1.1 Inputs

Input **shall consist of**

- o Bearing (1 word)
- o Status (1 word)
- o Localizer/glide slope deviation (2 words)
- o ILS ID (1 word)

3.2.5.22.1.2 Processing

The EQUIP shall format and scale the bearing data, and store it in a Compool. If the status has changed, the SSSM shall be **activated**.

3.2.5.22.1.3 Outputs

Output **shall consist of**

- o Bearing (1 word)
- o Localizer/glide slope deviations (2 words)

3.2.5.22.3 ILS Output EQUIP

This EQUIP formats control messages to the ILS. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.22.2.1 Inputs

Input **shall consist of**

- o On/off (1 word)
- o Auto/manual select (1 word)
- o Frequency select (1 word)
- o Course select
- o MDA select
- o ILS ID

3.2.5.22.2.2 Processing

The EQUIP shall generate the control message corresponding to the type/value of the input request.

3.2.5.22.2.3 Outputs

Output shall consist of

- o ILS command (1 word) and Status (1 word)

3.2.5.23 Compass Equipment Processes

The Magnetic Compass (C-12) provides heading information for navigation.

Two Compass EQUIPs are provided. The input EQUIP is activated cyclically to receive data; the output EQUIP formats Compass Commands to satisfy control requests.

3.2.5.23.1 Compass Input EQUIP

This EQUIP processes data from the Compass unit. It is activated four times per second.

3.2.5.23.1.1 Inputs

Input shall consist of

- o Heading (1 word)
- o Status (1 word)

3.2.5.23.1.2 Processing

The input EQUIP shall format and scale the heading data, and store it in a Compool. If the status has changed, the SSSM shall be activated.

3.2.5.23.1.3 Outputs

Output shall consist of

- o Heading (1 word)

3.2.5.23.2 Compass Output EQUIP

This EQUIP formats control messages to the Compass. It is activated whenever control is requested by a crew member via the IMK.

3.2.5.23.2.1 Inputs

Input shall consist of

- o On/off (1 word)
- o Slaved option (1 word)
- o D.G. (1 word)
- o Set heading (1 word)
- o Set latitude (1 word)

3.2.5.23.2.2 Processing

The output EQUIP shall generate the control message corresponding to the type/value of the input request.

3.2.5.23.2.3 Outputs

Output shall consist of

- o Compass command (1 word)
- o Status (1 word)

3.2.5.24 LR Radar Equipment Processes

The Long Range Radar (AN/APQ-122) provides precise navigation capabilities for long-range ground mapping, weather detection, and beacon interrogation. A high-resolution CRT radar display is available to the crew upon request.

The Radar EQUIP is activated by the Radar Tailored Mode SPEC whenever a formatted control message is to be sent to the unit.

3.2.5.24.1 Inputs

Input shall consist of

- o Mode select (1 word)
- o Frequency select (1 word)
- o Magnetic variation select (1 word)
- o RF power, gain (2 words)
- o Beam (1 word)
- o Azimuth stabilizer (1 word)
- o ISO echo (1 word)
- o Scan select (1 word)
- o Range select (1 word)
- o Fast time on/off (1 word)
- o Sens. time (1 word)
- o Frequency agile mode on/off (1 word)
- o Heading marker intensity (1 word)
- o Range marker intensity (1 word)
- o Sweep intensity (1 word)

3.2.5.24.2 Processing

The EQUIP shall generate the control message corresponding to the type/value of the input request, and store it in a Compool for subsequent transmission to the Long Range Radar.

3.2.5.24.3 Outputs

Output shall consist of

- o Radar command (1 word) and status (1 word)

3.2.5.25 IRD&W Equipment Processes

The Infrared Detection and Warning System is a defensive countermeasure which provides threat information. It interfaces with the MDSC to provide a quadrant-orientated threat display.

The IRDW EQUIP is activated by the IRDW Tailored Mode SPEC whenever a formatted control message is to be sent to the unit.

3.2.5.25.1 Inputs

Input shall consist of

- o on/off (1 word)

3.2.5.25.2 Processing

The EQUIP shall store the on (or off) control message in a Compool for subsequent transfer to the device.

3.2.5.25.3 Outputs

Output shall consist of

- o on/off command

3.2.5.26 RHAWS Equipment Process

The Radar Homing and Warning System (AN/APR-36/37) is a radar-detecting, defensive countermeasure which provides threat information to the crew via MPD display.

The RHAWS EQUIP is activated by the RHAWS Tailored Mode SPEC whenever a formatted control message is to be sent to the unit.

3.2 5.26.1 Inputs

Input shall consist of

- o on/off (1 word)

3.2.5.26.2 Processing

The EQUIP shall store the on (or off) control message in a Compool for subsequent transfer to the device.

3.2.5.26.2 Processing

The EQUIP shall store the on (or off) control message in a Compool for subsequent transfer to the device.

3.2.5.26.3 Outputs

Output shall consist of

- o On/Off Command (1 word)

3.2.5.27 Flight Surfaces Equipment Process

The current positions of controllable flight surfaces (e.g., flaps) are monitored for display and algorithm purposes.

The Flight Surfaces EQUIP is activated 2 times per second to read current position settings of the surfaces.

3.2.5.27.1 Inputs

Input shall consist of

- o Elevator Trim Positions (9 words)
- o Left-Wing Flap/Spoiler Positions (7 words)
- o Right Wing Flaps/Spoiler Positions (7 words)

3.2.5.27.2 Processing

The EQUIP shall process the input data as required, and store the result in a Compool.

3.2.5.27.3 Outputs

Output shall consist of

- o Elevator Trim Positions (9 words)
- o Left Flap Positions (7 words)
- o Right Flap Positions (7 words)

3.2.5.28 Aircraft Sensors Equipment Process

Aircraft sensors provide current status of -

- o Fuel
- o Engines
- o Power
- o Accelerometer

for display.

The Aircraft Sensors EQUIP is activated 2 times a second to read the current sensor output.

3.2.5.28.1 Inputs

Input shall consist of

- o Fuel (n words)
- o Engines (n words)
- o Power (n words)
- o Accelerometer (1 word)

3.2.5.28.2 Processing

The EQUIP shall process the input data as required, and store the results in a Compool.

3.2.5.28.3 Outputs

Output shall consist of

- o Fuel (n words)
- o Engines (n words)
- o Power (n words)
- o Accelerometer (1 word)

3.2.5.29 Brakes/Gear/Caution Equipment Process

The current status of the brake and landing gear systems, and the caution panel, is monitored for display and algorithm purposes.

The Brake/Gear/Caution EQUIP is activated 2 times a second to copy the current status.

3.2.5.29.1 Inputs

Input shall consist of

- o Weight-On-Gear (1 word)
- o Caution Lights (n words)
- o Master Caution Light (1 word)
- o Landing Gear (1 word)
- o Brakes (1 word)
- o Gear-Up and Locked (1 word)
- o Previous Values for the Above (n words)

3.2.5.29.2 Processing

The EQUIP shall process the input data as required, and store the results in a Compool. Changes in the status of any item from its previous value may result in the activation of the Error/Warning DISP.

3.2.5.29.3 Outputs

Output **shall consist of**

- o Weight-On-Gear (1 word)
- o Caution Lights (n words)
- o Master Caution Light (1 word)
- o Landing Gear (1 word)
- o Brakes (1 word)
- o Gear-Up and Locked (1 word)
- o Message ID (1 word)

3.2.5.30 Avionics On/Off Equipment Process

On/off control is provided for the following avionics equipment.

- o Counting Accelerometer
- o Gear-Up and Locked - left
- o Gear-Up and Locked - right
- o Weight on Gear - left
- o Weight on Gear - right
- o Stick Shaker 1
- o Stick Shaker 2
- o Stab. Trim Position
- o Flap Position - left
- o Flap Position - right
- o Fuel Totalizer
- o Engine 1
- o Engine 2
- o IRD & W
- o RH & W
- o Flares Dispenser
- o Long Range Radar
- o Radar Altimeter 1
- o Radar 2
- o Magnetic Compass
- o INS
- o OMEGA
- o ILS 1
- o ILS 2
- o LF ADF
- o UHF ADF
- o HUD 1
- o HUD 2
- o HSD 1
- o HSD 2
- o MPD 1
- o MPD 2
- o MPD 3
- o MPDG 1
- o MPDG 2
- o DSMU
- o MDSC
- o MFDC
- o HCU
- o MMK
- o TACAN
- o SKE
- o HF/SSB Radio
- o VHF-AM Radio
- o VHF-FM Radio
- o UHF-AM Radio 1
- o UHF-AM Radio 2
- o IFF
- o Secure Voice
- o Public Address
- o Intercommunication Set

The Avionics On/Off EQUIP is activated by the Avionics On/Off Tailored Mode SPEC whenever On/Off control is requested from the IMK.

3.2.5.30.1 Inputs

Input **shall consist of**

- o Equipment ID (1 word)
- o On/Off Control (1 word)

3.2.5.30.2 Processing

The EQUIP shall generate the on (or off) message and store in a Compool for subsequent transfer to the specified device.

3.2.5.30.3 Outputs

Output shall consist of

- o On/Off Command (1 word)

3.2.5.31 FDR Equipment Process

The Flight Data Recorder (AN/ASH-31V) is a survivable recorder used for storing a current 30-minute history of voice communications and flight data. A beacon transmitter facilitates recovery after deployment.

The FDR EQUIP in activated cyclically TBD times per second.

3.2.5.31.1 Inputs

Input shall be Compool data to be recorded.

- o Data (n words)

3.2.5.31.2 Processing

At each activation, the FDR EQUIP shall format two channels of data and store it in a Compool for transfer to the FDR.

3.2.5.31.3 Outputs

Output shall be data to be sent to FDR.

- o Data (n words)

3.2.6 Special Requirements

This section contains special requirements imposed on Application Software development.

3.2.6.2 JOVIAL J73

All Applications Software will be coded in the JOVIAL J73 higher order language.

3.2.6.1 Structured Programming

Top-down, structured programming concepts will be used throughout Applications Software development. Software elements will be established which correspond to functions defined in this document.

3.3 Adaptation

This section summarizes the Applications Software requirements with respect to the operating facility, system parameters, and system capacities.

3.3.1 General Environment

Further definition of the IDAMST system design is required prior to completing this portion of the specification. Pending definition the following assumptions are made.

3.3.1.1 IDAMST Core Elements

IDAMST core element hardware including the core element control/displays are assumed to be identical in all AMST aircraft and require no modification or variations in software to adapt the IDAMST OFP and OTP software.

3.3.1.2 Other IDAMST Integrated Hardware

Variations in AMST equipment complement associated with the IDAMST system is expected. It is assumed that the IDAMST OFP and OTP software will be automatically adaptable to hardware variations in the AMST. This will be accomplished through the use of an equipment status word from the IDAMST avionic hardware which identifies the existing hardware configuration. The OFP and OTP software will subsequently adapt to the actual configuration by omitting software functions associated with non-existent avionics hardware elements. The OFP and OTP software will compile a list of active and installed avionic equipment hardware and display list upon command and also write list on DITS recorder for a maintenance record.

3.3.2 System Parameters

Constants and other data pertaining to the particular mission must be available at load time for the Application Software to function at full capability.

3.3.3 System Capacities

Estimated capacity requirements of the Applications Software is summarized in **Table** 3.3-1. These estimates are related to an IDAMST processor like that described in Reference 2.2(c), "Prime Item Product Fabrication Specification for DAIS Processor", and allow a 25% growth margin.

	INST	DATA	NOM EXEC.
IDAMST Master Processor			
Top Level Control	7800	5854	304.4
Flight & Propulsion	1900	495	16.0
Communication	1515	339	1.6
Nav. & Guidance	4511	835	6.8
Aircraft System	3580	2200	52.9
Defense	230	29	
Misc	1500	300	
	21136	10053	381.7
IDAMST Monitor Processor			
Top Level Control	7800	5470	210.0
Flight & Propulsion	1880	492	16.0
Communication	1515	339	1.6
Nav. & Guidance	4511	835	6.8
Aircraft System	3580	2200	52.9
Defense	230	29	
Misc	1500	300	
	21016	9665	277.3
IDAMST Remote Processor			
Top Level Control	2500	2419	108
Flight & Propulsion	75	16	3.2
Nav. & Guidance	5210	431	14.0
Aircraft Systems	2700	326	7.1
Defense	25	6	
Misc	400	100	
	10910	3298	132.3

TABLE 3.3-1 IDAMST STORAGE/TIMING ESTIMATES

This page intentionally left blank.

4.0 QUALITY ASSURANCE PROVISIONS

This section identifies the basic method for accomplishing software verification.

4.1 Introduction

IDAMST CPCIs will incorporate top-down, structured concepts, described briefly below:

Structured Program

A structured program is a computer program constructed of a basic set of control logic figures which provide at least the following: Sequence of two or more operations, conditional branch to one of two operations and return repetition of an operation. A structured program has only one entry and one exit point. A path will exist from the entry to each node and from each node to the exit. In addition, certain practices are associated, such as indentation of source code to represent logic levels, use of intelligent data names and descriptive commentary.

Top-Down Programming

Top-down programming is the concept of performing in hierarchical sequence a detailed design, code, integration and test as concurrent operations.

Top-Down Structured Programs

A top-down structured program is a structured program with the additional characteristics of the source code being *logically but not physically* segmented in a hierarchical manner and only dependent on code already written. Control of execution between segments is restricted to transfers between vertically adjacent hierarchical segments.

Top-down coding and verification is an ordering of system development which allows for continual integration of the system parts as they are developed and provides for interfaces prior to the parts being developed. At each stage, the code already tested drives the new code, and only external data is required.

In top-down programming, the system is organized into a tree structure of segments. The top segments contain the highest level of control logic and decisions within the program, and either passes control to the next level segments or identifies the next level segments for in-line inclusions. The next level may include stubs. Stubs which are to be replaced eventually with running code may contain a "no operation" instruction or possibly a display statement to the effect that control has been received. The process of replacement of successively lower level stubs with operational code continues until all functions within a system are coded and verified.

In top-down coding and verification, the highest level element is coded first. Coding, checkout, and integration proceed down the hierarchy until the lowest levels have been integrated. This does not imply that all elements at a given level are developed in parallel. Some branches will intentionally be developed early, e.g., to permit early training and early development of critical functions or hardware/software integration.

Many systems interfaces occur through the data base defintion in addition to calling sequence parameters. Top-down programming requires that sufficient data definition statements be coded and that data records be generated before exercising any segment which references them. Ideally, this leads to a single set of definitions serving all the programs in a given application.

This approach provides the ability to evolve the product in a manner that maintains the characteristic of always being operable, extremely modular and always available for successive levels of testing that accompany the corresponding levels of implementation. Exception to the top-down coding and integration approach will be considered on a case-by-case basis.

Each computer program will be coded in a higher order language. Use of assembly or machine language will be restricted to coding of certain executive functions where the higher order language cannot be used.

Real Time Structured Programs

An additional complexity in the IDAMST system is the Real Time, asynchronous communication of structured programs as tasks. Tasks are also organized as a hierarchy. Each task has a Controller Task which is the only task permitted to schedule or cancel the lower level task. However, any task is permitted to activate any other task in IDAMST.

4.2 Computer Program Verification

Computer program verification is the process of determining whether the results of executing a computer program in a test environment agree with the specification requirements. Verification is usually only concerned with the logical correctness of the computer program (i.e., satisfying the functional/performance requirements) and may be a manual or a computer-based process (i.e., testing software by executing it on a computer).

The use of top-down structured programming techniques provide certain program characteristics that may lead to a simplification of the computer program verification process. Top-down integration of the program elements in a CPCI minimizes the use of complex driver routines and replaces them with actual program elements and simple program stubs. It also provides a system in which the computer program is continually being tested as successively lower levels of program elements are integrated and the interfaces between program elements are verified prior to the integration of the next lower level.

4.2.1 Program Element Tests

Program elements are coded in the sequence required for top-down integration. When coding and code review are completed, each program element shall be functionally tested in a stand-alone configuration by the programmer to assure that the element can be executed and that the specified functions are performed. Since program elements are small and are restricted to one entry point and one exit point, the test environment is relatively simple.

4.2.2 CPCI Integration Tests

Following successful completion of the Program Element Tests, the program elements are entered into the Computer Program Library where they are subjected to configuration control procedures. Controlled program elements are compiled/assembled, link-edited and the current CPCI version is made available for integration testing. Integration tests are dynamic tests designed to verify program functions and interfaces between program elements and with the data base. The result is a complete CPCI for which all design features have been verified.

The integration of program elements or tasks into the complete computer program shall be accomplished in a top-down sequence. The highest level elements which contain the highest level controller tasks shall be tested and integrated first. These tasks are the Master Sequencer, Configurator, Request Processor, and Subsystem Status Monitor. Testing and integration shall proceed down the hierarchy until all program elements (e.g., equipment interface functions), have been integrated and the design completely verified.

An important aspect of integration testing of IDAMST will be the invocation and synchronization of the tasks, since these functions do not fall under the structured programming rules.

4.2.3 Formal Software Testing

The purpose of formal testing is to confirm that the computer program performs the functions and satisfies the performance requirement contained in the software requirements specification. Formal testing consists of Preliminary Qualification Tests (PQT) and Formal Qualification Tests (FQT), and are conducted in accordance with Air Force approved test plans.

Pre-Qualification Testing (PQT)

PQT is an incremental process which provides visibility and control of the CPC development during the time period between the Critical Design Review and Formal Qualification Testing.

PQT consists of functional level tests, conducted at the development facility, and using Air Force approved test plans. These tests will use documented procedures, completed by the contractor, and submitted to the Air Force Sufficiently in advance of the scheduled test session to permit review and analysis. They will typically use controlled inputs specifically prepared for the test purpose.

A Pre-Qualification test will generally be conducted for each CPCI function. If a test's cost or time consumption estimates are significantly high, the test will be deferred to FQT unless it is time-critical or performance-critical to the development of the CPCI.

5.0 PREPARATION FOR DELIVERY

Not applicable.

6.0 NOTES

6.1 Growth Items

The specified growth items were evaluated and the impact to the IDAMST configuration was assessed.

6.1.1 Joint Tactical Information Distribution System (JTIDS)

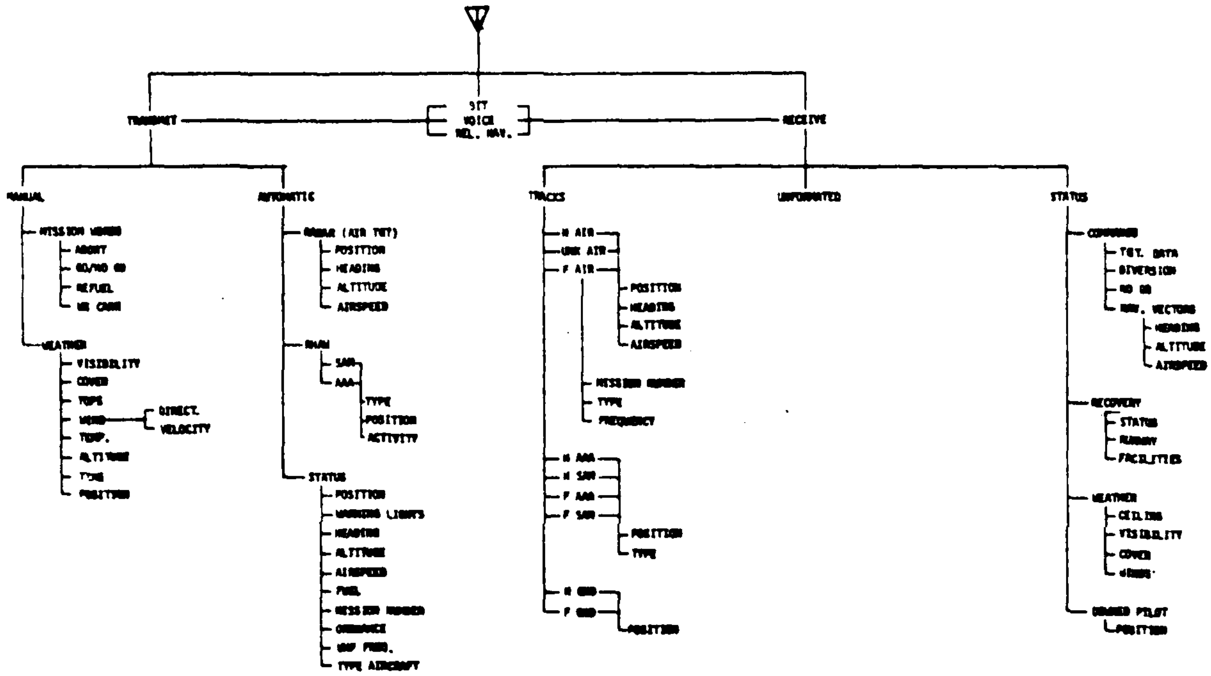
The Joint Tactical Information Distribution System (JTIDS) is a digital, secure, jam-resistant, communication system for real-time command and control of combat operations. JTIDS is planned to interconnect the tactical and air defense elements of all services, including surface and airborne command, control, surveillance and intelligence centers, Navy ships and combat and support aircraft. JTIDS will provide a high degree of interoperability between data collection elements, combat elements and command and control centers within a military theater of operations. Precise signal time-of-arrival measurements, coupled with the transmission of emitter location, are used to generate a common grid coordinate system containing the location of all active net participants. The system uses Time Division Multiple Access (TDMA) to interconnect all system users into one common channel, or network, for distribution of information. Each authorized network element is allocated a dynamic number of transmit time slots within the network reporting cycle as needed for its mission. When not transmitting, each element monitors the transmissions of the other elements and extracts the information as needed. Since the system is nodeless, survivability is enhanced and the system exists as long as two or more elements exist.

The basic JTIDS system for any aircraft will receive, process and display information to the crew and collect, convert and format its own data for broadcast distribution to the net. The baseline JTIDS functions are shown in Figure 6.1-1.

As can be seen from Figure 6.1-1, the two obvious major categories are transmit and receive. Common to both of these functions are the elements of voice, relative navigation and Built-in-Test (BIT). A brief description of the remaining functional elements is contained in the following sections:

Transmit Manual: These are the functions that would require pilot actions in order to initiate transmission. Throughout this study, the functions under this category were deliberately limited due to the constraint of a two-man crew. The only two areas recommended are:

- o Mission Words - These elements are to provide key transmissions to command and control agencies. The messages would concern essential mission decisions.
- o Weather - This element would allow PIREPS from targets or critical rendezvous areas. The pilot would only initiate inputs for visibility, cloud cover and cloud height. The other elements under this function would automatically be formatted from the navigation computer.



BASELINE JTIDS TRANSMIT/RECEIVE FUNCTIONS

FIGURE 6.1-1

Transmit Automatic: These are the functions that would be transmitted automatically as long as the system is operating. The major elements are:

- o Radar (Air Target) - This transmission would provide the net information on a heretofore unknown hostile aircraft. The message would be sent only after the pilot has locked-on an airborne target that is not being reported on the JTIDS network.
- o RHAW - Any RHAW threat received that does not correlate with the threat signals being reported on the JTIDS net would constitute a new message to be formatted and transmitted.
- o Status - The elements under this function would automatically be transmitted, either continuously or intermittently, as the situation dictates.

Receive Tracks: All hostile, unknown and friendly tracks and positions are grouped under this major function. The elements would be received, stored and formatted for display upon pilot commands.

Receive Status: The functions in this category reflect formatted command messages and information concerning the status and weather of various areas of interest. These elements would also be received, stored and formatted for display upon pilot commands.

Unformatted: This category is for received messages that are free text alphanumeric and meet no structured format. The functional area of these messages cannot be categorized as they are unlimited as to content.

The JTIDS computational requirements were analyzed and assessed as follows:

	Words
JTIDS Network Processing	4,250
JTIDS Message Processing	2,925
JTIDS Message Control	1,525
JTIDS Self Test	1,200

Estimated throughput requirements = 110 KOPS.

It is recommended that the JTIDS function be implemented with a dedicated processor because of the computation requirements. Additionally, developmental efforts and interface requirements would be reduced with a dedicated processor.

Assuming a dedicated processor in the JTIDS system, the impact of interfacing JTIDS with the IDAMST system as a growth item is as follows:

- o Data link between JTIDS and IDAMST processors via the multiplexed data bus.
- o IMK and DEK functions will have to be expanded to include JTIDS manual data entry functions.

- JTIDS display requirements will have to be incorporated into the IDAMST specified displays. Displays requirements fall within three categories: 1) command data; 2) MAP data; and 3) miscellaneous mission data.

- IDAMST navigation subfunction will have to be modified to utilize the relative navigation capability of the JTIDS system. The accuracy of JTIDS data will be dependent upon the accuracy of the transmitted position and relative navigation calculation. The expected error of the JTIDS mechanization is expected to be insignificant; therefore, JTIDS relative navigation data may be used for updating if JTIDS station positions are accurately known.

6.1.2 Terrain Following/Terrain Avoidance (TF/TA)

A limited TF/TA capability is reflected in the ground proximity warning system mechanization which utilizes radar altimeter data and barometric altitude rate. For a truly effective TF/TA system mechanization, a forward looking, TF/TA type radar is required to sense the terrain over which the airplane is expected to fly. Assuming that some type of TF/TA radar would be installed to provide TF/TA capability, the following will be required to integrate TF/TA capability into the IDAMST configuration:

- TF/TA radar system control panel requirements have to be allocated to IMK functions or dedicated control panels.

- TF/TA radar display data would be interfaced with the digital scan converter for formatting compatible with IDAMST CRT display devices.

- Interface between TF/TA radar and avionics system would include stabilization data to TF/TA radar, TF command data for input to the flight director command calculations for display.

- TF command data to the flight controls would be routed directly to the flight control system to minimize data lag to enable close coupling with the flight control system.

6.1.3 Global Positioning System (GPS)

The Global Positioning System (GPS) is a satellite navigation system currently in development by the Department of Defense. In its operational deployment, 24 satellites will be orbited at about 11,000 nautical miles to provide Earth coverage for navigation and weapon delivery. At least six satellites will be in view from any location. The satellites will broadcast their identity, position, and highly accurate time. User equipment will select the four most appropriate satellites and solve four equations in four unknowns to display to the user his position in three dimensions and time.

It is presently anticipated that the GPS will be developed as a TACAN hardware replacement with installation and interface requirements to be compatible with the AN/ARN 118 TACAN set. The GPS system will be self-contained with a dedicated processor in the GPS system. A dedicated processor will minimize GPS developmental activities in individual applications by specifying a standard computer interface. Integrating the GPS into the IDAMST configuration will have the following impact:

- o GPS controls and status will have to be integrated into the IMK functions.
- o Data link between GPS and IDAMST processors via the multiplexed data bus. Hardware impact to be minimal if TACAN provisions are utilized.
- o IDAMST navigation subfunction will have to be modified to utilize the GPS data, position and velocity, in determining the aircraft position. The expected accuracy of 100 meters of the low cost GPS will increase the operational capability of the IDAMST configuration.
- o Advanced GPS concepts to provide higher anti-jam capability if required, for the AMST airplane, will increase interface requirements for directional antenna and inertial reference information.

10.0 APPENDIX I: HARDWARE/SOFTWARE SIGNAL LIST

The functional interface between avionics hardware and the mission software is defined in terms of a hardware/software interface. The hardware involved in this interface is listed below:

- Air/Ground System
- Approach Indicating System
- Fire Warning System
- Automatic Braking System
- Flight Surfaces Status System
- Fuel Measurement System
- Avionics Power Control Logic System
- Engine Transducers
- Master Caution System
- Flight Control/Avionics Subsystems
- Long Range Radar
- Radar Altimeters
- Magnetic Compass
- Inertial Navigation System
- OMEGA Navigation System
- Public Address System
- HF/SSB Radio
- VHF/FM Radio
- UHF/AM Radio
- Intercommunication Set
- UHF/AM Radio
- Instrument Landing Systems
- LF ADF
- Intraformation Positioning Set (SKE)
- TACAN
- UHF ADF
- Infrared Detection and Warning System
- Flares Dispenser Unit
- Radar Homing and Warning System
- IDAMST Controls and Displays
- IDAMST Core Elements

A detailed signal-by-signal printout for each hardware system is provided with the following data available from each signal.

INPUT: Signals originating in the avionic hardware

OUTPUT: Signals originating in the mission software

SIGNAL NAME: Brief description of signal

SIGID: Signal identification number - used for bookkeeping purposes

TYPE: Characteristic of signal interface

01 single ended discrete
02 differential discrete
03 switch closure open/gnd
04 switch closure open 28V
05 single ended dc analog
06 differential dc analog
07 single ended ac analog
08 differential ac analog
09 synchro
10 serial digital
11 pulse converter
18 resolver

VOLTAGE RANGE: The electrical voltage minimum and maximum

PARAMETER RANGE: The particular parameter characteristics minimum and maximum

SCALE FACTOR: The parameter relation to the electrical range

RESOLUTION: The percent accuracy of the signal

QUANTIZATION: The number of bits to which the signal is resolved

U/R: The signal update rate is a per second quantity

B/R: The bit rate is the total number of bits per second

The hardware/software interfaces were obtained by examining each hardware unit and listing its characteristics when the following conditions were satisfied:

- o Avionic hardware signals which interfaces with other avionic hardware located in subsystems other than its own.
- o Avionic hardware signals which interface with mission software.
- o Mission software signals which interface with avionic hardware, including controls and displays.

1 1 0 AIR/GROUND SYSTEM

INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LNG GEAR SW(AUSS)	43146	3					1	1	1
SEC DC POWER	27003	4	OPEN OR 28VDC	NA	OPEN=WT OFF GEAR	NA	1	2	2
LDG GEAR DR POS-N1	1009	3					1	1	1
LDG GEAR DR POS-N2	1010	3					1	1	1
LDG GEAR DR POS-L1	1011	3					1	1	1
LDG GEAR DR POS-L2	1012	3					1	1	1

1 2 0 APPROACH INDICATING SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
STICK SHAKER 1	2001	3					1	8	8
STICK SHAKER 2	2002	3					1	8	8

1 8 0 FIRE AND SMOKE DETECTION SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ENGINE 1 LOOP A	8001	4					1	2	2
ENGINE 1 LOOP B	8003	4					1	2	2
ENGINE 2 LOOP A	8005	4					1	2	2
ENGINE 2 LOOP B	8007	4					1	2	2
ENGINE 1 LOOP A	8002	4					1	2	2
ENGINE 1 LOOP B	8004	4					1	2	2
ENGINE 2 LOOP A	8006	4					1	2	2
ENGINE 2 LOOP B	8008	4					1	2	2

1 10 0 AUTOMATIC BRAKING SYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ANTI SKID	10001	3					1	1	1
BRAKE LOW PRESS	10002	3					1	1	1
AUTO BRAKE DSARM	10003	3					1	1	1

1 11 0 FLIGHT SURFACE STATUS SYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
STABILIZER TRIM	11002	3					1	2	2
STABILIZER TRIM	11001	3					1	2	2
ELEV POS L	11017	18					14	16	224
ELEV POS R	11018	18					14	16	224
RUDDER POS	11019	18					14	16	224
LE FLP EXT AR	11009	3					1	1	1
LE FLP EXT BR	11010	3					1	1	1
LE FLP EXT AL	11011	3					1	1	1
LE FLP EXT BL	11012	3					1	1	1
OUTBOARD FLP POS(L)	11003	18					14	16	224
MID FLP POS (L)	11004	18					14	16	224
US LEFT	11005	18					14	16	224
SPOILER 1L POS	11020	18					14	16	224
SPOILER 2L POS	11021	18					14	16	224
LE FLP IND AR	11013	3					1	1	1
LE FLP IND BR	11014	3					1	[illegible]	1
LE FLP IND AL	11015	3					1	1	1
LE FLP IND BL	11016	3					1	1	1
OUTBOARD FLP POS(R)	11006	18					14	16	224
MID FLAP POS(R)	11007	18					14	16	224
USL RIGHT	11008	18					14	16	224
SPOILER 1R POS	11022	18					14	16	224
SPOILER 2R POS	11023	18					14	16	224

1 12 0 FUEL CG MEASUREMENT SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
FUEL [illegible]	12001	5	0-24.5 VDC				11	8	88
FUEL [illegible]	12002	8	0-24.5 VDC				11	9	88
FUEL [illegible]	12003	6	0-24.5 VDC				11	8	88
FUEL [illegible]	12004	6	0-24.5 VDC				11	8	88
FUEL [illegible]	12005	7	0-24.5 VDC				11	8	88

2.13.0 AVIONICS POWER CONTROL LOGIC SYSTEM INPUT

SIGNAL NAME		SIGNO	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	111	13002	3					1	8	8
RPC STATUS	114	13004	3					1	8	8
RPC STATUS	116	13006	3					1	8	8
RPC STATUS	115	13008	3					1	8	8
RPC STATUS	117	13010	3					1	8	8
RPC STATUS	123	13012	3					1	8	8
RPC STATUS	126	13014	3					1	8	8
RPC STATUS	1111	13016	3					1	8	8
RPC STATUS	1112	13018	3					1	8	8
RPC STATUS	1112	13020	3					1	8	8
RPC STATUS	1112	13022	3					1	8	8
RPC STATUS	1113	13024	3					1	8	8
RPC STATUS	1113	13026	3					1	8	8
RPC STATUS	1113	13028	3					1	8	8
RPC STATUS	1122	13030	3					1	8	8
AV. RPC STATUS		13032	3					1	8	8
N1 RPC STATUS		13034	3					1	8	8
N2 RPC STATUS		13036	3					1	8	8
EGT RPC STATUS		13038	3					1	8	8
OIL RPC STATUS		13040	3					1	8	8
OIL RPC STATUS		13042	3					1	8	8
FF RPC STATUS		13044	3					1	8	8
AV. RPC STATUS		13046	3					1	8	8
N1 RPC STATUS		13048	3					1	8	8
N2 RPC STATUS		13050	3					1	8	8
EGT RPC STATUS		13052	3					1	8	8
OIL RPC STATUS		13054	3					1	8	8
OIL RPC STATUS		13056	3					1	8	8

1 13 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
EE RPC STATUS		13058	3					1	8	8
RPC STATUS	210	13060	3					1	8	8
RPC STATUS	210	13062	3					1	8	8
RPC STATUS	210	13064	3					1	8	8
RPC STATUS	210	13066	3					1	8	8
RPC STATUS	210	13068	3					1	8	8
RPC STATUS	230	13070	3					1	8	8
RPC STATUS	230	13074	3					1	8	8
RPC STATUS	230	13072	3					1	8	8
RPC STATUS	230	13076	3					1	8	8
RPC STATUS	240	13078	3					1	8	8
RPC STATUS	240	13080	3					1	8	8
RPC STATUS	240	13082	3					1	8	8
RPC STATUS	250	13084	3					1	8	8
RPC STATUS	250	13086	3					1	8	8
RPC STATUS	250	13088	3					1	8	8
RPC STATUS	260	13090	3					1	8	8
RPC STATUS	260	13092	3					1	8	8
RPC STATUS	311	13094	3					1	8	8
RPC STATUS	320	12096	3					1	8	8
RPC STATUS	330	13098	3					1	8	8
RPC STATUS	340	13100	3					1	8	8
RPC STATUS	360	13102	3					1	8	8
RPC STATUS	370	13104	3					1	8	8
RPC STATUS	380	13106	3					1	8	8
RPC STATUS	380	13108	3					1	8	8
RPC STATUS	391	13110	3					1	8	8
RPC STATUS	392	13112	3					1	8	8

1 13 0 AVIONICS POWER CONTROL LOGIC SYSTEM INPUT

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	411	13114	3					1	8	8
RPC STATUS	4111	13116	3					1	8	8
RPC STATUS	420	13118	3					1	8	8
RPC STATUS	420	13120	3					1	8	8
RPC STATUS	430	13122	3					1	8	8
RPC STATUS	430	13124	3					1	8	8
RPC STATUS	450	13126	3					1	8	8
RPC STATUS	460	13128	3					1	8	8
RPC STATUS	460	13130	3					1	8	8
RPC STATUS	460	13132	3					1	8	8
RPC STATUS	470	13134	3					1	8	8
RPC STATUS	450	13136	3					1	8	8
RPC STATUS	450	13138	3					1	8	8
RPC STATUS	480	13140	3					1	8	8
RPC STATUS	511	13142	3					1	8	8
RPC STATUS	512	13144	3					1	8	8
RPC STATUS	513	13146	3					1	8	8
RPC STATUS	514	13148	3					1	8	8
RPC STATUS	520	13150	3					1	8	8
RPC STATUS	531	13152	3					1	8	8
RPC STATUS	SCP	13154	3					1	8	8
RPC STATUS	IMK	13155	3					1	8	8
RPC STATUS	IMK	13158	3					1	8	8
RPC STATUS	IMK	13160	3					1	8	8
RPC STATUS	IMK	13162	3					1	8	8
RPC STATUS	CSMU	13164	3					1	8	8
RPC STATUS	CEK	13166	3					1	8	8
RPC STATUS	CEK	13168	3					1	8	8

1 1? 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	MMK	13170	3					1	8	8
RPC STATUS	SYM	13172	3					1	8	8
RPC STATUS	MPDG1	13174	3					1	8	8
RPC STATUS	MPDG2	13176	3					1	8	8
RPC STATUS	SCAN	13178	3					1	8	8
RPC STATUS	RPD1	13180	3					1	8	8
RPC STATUS	RPD2	13182	[illegible]					1	8	8
RPC STATUS	RPD3	13184	3					1	8	8
RPC STATUS	HUD1	13186	3					1	8	8
RPC STATUS	HUD2	13188	3					1	8	8
RPC STATUS	HSD1	13190	3					1	8	8
RPC STATUS	HSD2	13192	3					1	8	8
RPC STATUS	AFDC	13194	3					1	8	8
RPC STATUS	HND	13196	3					1	8	8
RPC STATUS	HND	13198	3					1	8	8
RPC STATUS	IMK	13200	3					1	8	8
RPC STATUS	IMK	13202	3					1	8	8
RPC STATUS	IMK	13204	3					1	8	8
RPC STATUS	IMK	13206	3					1	8	8
RPC STATUS	DSMU	13208	3					1	8	8
RPC STATUS	DEK	13210	3					1	8	8
RPC STATUS	DEK	13212	3					1	8	8
RPC STATUS	MMK	13214	3					1	8	8
RPC STATUS	SYM	13216	3					1	8	8
RPC STATUS	MPDG1	13218	3					1	8	8
RPC STATUS	MPDG2	13220	3					1	8	8
RPC STATUS	SCAN	13222	3					1	8	8
RPC STATUS	RPD1	13224	3					1	8	8

1 1? 0 AVIONICS POWER CONTROL LOGIC SYSTEM INPUT

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	MPD2	13226	3					1	8	8
RPC STATUS	MPD3	13228	3					1	8	8
RPC STATUS	HUD1	13230	3					1	8	8
RPC STATUS	HUD2	13232	3					1	8	8
RPC STATUS	HSD1	13234	3					1	8	8
RPC STATUS	HSD2	13236	3					1	8	8
RPC STATUS	MFDL	13238	3					1	8	8

1 13 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
28 VDC RPC CTL 111	13001	1					1	8	8
28 VDC RPC CTL 114	13003	1					1	8	8
28 VDC RPC CTL 116	13005	1					1	8	8
28 VDC RPC CTL 115	13007	1					1	8	8
28 VDC RPC CTL 117	13009	1					1	8	8
28 VDC RPC CTL 123	13011	1					1	8	8
28 VDC RPC CTL 125	13013	1					1	8	8
26 VAC RPC CTL 1111	13015	1					1	8	8
26 VAC RPC CTL 1112	13017	1					1	8	8
26 VAC RPC CTL 1112	13019	1					1	8	8
26 VAC RPC CTL 1112	13021	1					1	8	8
26 VAC RPC CTL 1113	13023	1					1	8	8
26 VAC RPC CTL 1113	13025	1					1	8	8
26 VAC RPC CTL 1113	13027	1					1	8	8
26 VAC RPC CTL 1122	13029	1					1	8	8
28 VDC AVI RPC CTL	13031	1					1	8	8
28 VDC N1 RPC CTL	13033	1					1	8	8
28 VDC N2 RPC CTL	13035	1					1	8	8
28 VDC EST RPC CTL	13037	1					1	8	8
28 VDC OIL RPC CTL	13039	1					1	8	8
28 VDC OIL RPC CTL	13041	1					1	8	8
28 VDC FF RPC CTL	13043	1					1	8	8
28 VDC AVI RPC CTL	13045	1					1	8	8
28 VDC N1 RPC CTL	13047	1					1	8	8
28 VDC N2 RPC CTL	13049	1					1	8	8
28 VDC EST RPC CTL	13051	1					1	8	8
28 VDC OIL RPC CTL	13053	1					1	8	8
28 VDC OIL RPC CTL	13055	1					1	8	8

1 15 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
28 VDC EE RPC CTL	13057	1					1	8	8
3PH 115VAC RPC CTL	13059	1					1	8	8
28 VDC RPC CTL 210	13061	1					1	8	8
26 VAC RPC CTL 210	13063	1					1	8	8
3PH 115VAC RPC CTL	13065	1					1	8	8
3PH 115VAC RPC CTL	13067	1					1	8	8
3PH 115VAC RPC CTL	13069	1					1	8	8
28 VDC RPC CTL 230	13073	1					1	8	8
3PH 115VAC RPC CTL	13071	1					1	8	8
28 VDC RPC CTL 230	13075	1					1	8	8
3PH 115VAC RPC CTL	13077	1					1	8	8
26 VAC RPC CTL 240	13079	1					1	8	8
28 VDC RPC CTL 240	13081	1					1	8	8
3PH 115VAC RPC CTL	13083	1					1	8	8
28 VDC RPC CTL 250	13085	1					1	8	8
26 VAC RPC CTL 250	13087	1					1	8	8
3PH 115VAC RPC CTL	13089	1					1	8	8
28 VDC RPC CTL 260	13091	1					1	8	8
28 VDC RPC CTL 311	13093	1					1	8	8
3PH 115VAC RPC CTL	13095	1					1	8	8
28 VDC RPC CTL 330	13097	1					1	8	8
28 VDC RPC CTL 340	13099	1					1	8	8
28 VDC RPC CTL 360	13101	1					1	8	8
28 VDC RPC CTL 370	13103	1					1	8	8
28 VDC RPC CTL 380	13105	1					1	8	8
115 VAC RPC CTL 380	13107	1					1	8	8
28 VDC RPC CTL 391	13109	1					1	8	8
28 VDC RPC CTL 392	13111	1					1	8	8

I IP C AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	P/R
28 VDC RPC CTL 411	13113	1					1	8	8
28 VDC RPC CTL 4111	13115	1					1	8	8
28 VDC RPC CTL 420	13117	1					1	8	8
28 VDC RPC CTL 420	13119	1					1	8	8
3PH 115VAC RPC CTL	13121	1					1	8	8
28 VDC RPC CTL 430	13123	1					1	8	8
28 VDC RPC CTL 450	13125	1					1	8	8
28 VDC RPC CTL 460	13127	1					1	8	8
28 VDC RPC CTL 460	13129	1					1	8	8
115VAC RPC CTL 460	13131	1					1	8	8
28 VDC RPC CTL 470	13133	1					1	8	8
28 VDC RPC CTL 480	13135	1					1	8	8
28 VDC RPC CTL 480	13137	1					1	8	8
115VAC RPC CTL 480	13139	1					1	8	8
28 VDC RPC CTL 511	13141	1					1	8	8
28 VDC RPC CTL 512	13143	1					1	8	8
28 VDC RPC CTL 513	13145	1					1	8	8
28 VDC RPC CTL 514	13147	1					1	8	8
28 VDC RPC CTL 520	13149	1					1	8	8
115VAC RPC CTL 531	13151	1					1	8	8
28 VDC RPC CTL SCP	13153	1					1	8	8
115VAC RPC CTL IMK	13155	1					1	8	8
115VAC RPC CTL IMK	13157	1					1	8	8
28 VDC RPC CTL IMK	13159	1					1	8	8
28 VDC RPC CTL IMK	13161	1					1	8	8
3PH 115VAC RPC CTL	13163	1					1	8	8
28 VDC RPC CTL DEK	13165	1					1	8	8
28 VDC RPC CTL DEK	13167	1					1	8	8

1 13 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	OUTPUT RESOLUTION	QUAN	U/R	B/R
28 VDC RPC CTL MMK	13169	1					1	8	8
28 VDC RPC CTL SYM	13171	1					1	8	8
3PH 115VAC RPC CTL	13173	1					1	8	8
3PH 115VAC RPC CTL	13175	1					1	8	8
3PH 115VAC RPC CTL	13177	1					1	8	8
3PH 115VAC RPC CTL	13179	1					1	8	8
3PH 115VAC RPC CTL	13181	1					1	8	8
3PH 115VAC RPC CTL	13183	1					1	8	8
3PH 115VAC RPC CTL	13185	1					1	8	8
3PH 115VAC RPC CTL	13187	1					1	8	8
3PH 115VAC RPC CTL	13189	1					1	8	8
3PH 115VAC RPC CTL	13191	1					1	8	8
28 VDC RPC CTL AFDC	13193	1					1	8	8
28 VDC RPC CTL HND	13195	1					1	8	8
28 VDC RPC CTL HND	13197	1					1	8	8
115VAC RPC CTL IMK	13199	1					1	8	8
115VAC RPC CTL IMK	13201	1					1	8	8
28 VDC RPC CTL IMK	13203	1					1	8	8
28 VDC RPC CTL IMK	13205	1					1	8	8
3PH 115VAC RPC CTL	13207	1					1	8	8
28 VDC RPC CTL DEK	13209	1					1	8	8
28 VDC RPC CTL DEK	13211	1					1	8	8
28 VDC RPC CTL MMK	13213	1					1	8	8
3PH 115VAC RPC CTL	13215	1					1	8	8
3PH 115VAC RPC CTL	13217	1					1	8	8
3PH 115VAC RPC CTL	13219	1					1	8	8
3PH 115VAC RPC CTL	13221	1					1	8	8
3PH 115VAC RPC CTL	13223	1					1	8	8

1 13 0 AVIONICS POWER CONTROL LOGIC SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
3PH 115VAC RPC CTL	13225	1					1	8	8
3PH 115VAC RPC CTL	13227	1					1	8	8
3PH 115VAC RPC CTL	13229	1					1	8	8
3PH 115VAC RPC CTL	13231	1					1	8	8
3PH 115VAC RPC CTL	13233	1					1	8	8
3PH 115VAC RPC CTL	13235	1					1	8	8
28 VDC RPC CTL XFDC	13237	1					1	8	8

1 14 0 ENGINE TRANSDUCERS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ENG 1 REVERSER	14015	3					1	1	1
ENG 1 N1	14005	11	0-5V				7	8	56
ENG 1 N2	14007	11	43V				7	8	56
ENG 1 EGT	14009	6	0-40MV				11	1	11
ENG 1 OIL PRES	14013	8	9.9-17.9V				11	2	22
ENG 1 OIL QTY	14011	8	6.8V				11	1	11
FF I/O	14003	6	0.4.97V				11	2	22
FF DRUM PULSE	14001	11	0-1.5VDC				10	4	40
ENG 1 OVERHEAT	14017	3					1	1	1
ENG 1 AFT NACELLE	14019	3					1	1	1
ENG 1 NOZZLE	14021	3					1	1	1
ENG 2 REVERSER	14016	3					1	1	1
ENG 2 N1	14006	11	0-5V				7	8	56
ENG 2 N2	14008	11	43V				7	8	56
ENG 2 EGT	14010	6	0-40MV				11	1	11
ENG 2 OIL PRES	14014	8	9.9-17.9V				11	2	22
ENG 2 OIL QTY	14012	8	6.8V				11	1	11
FF I/O	14004	6	0.4.97V				11	2	22
FF DRUM PULSE	14002	11	0-1.5VDC				10	4	40
ENG 2 OVERHEAT	14018	3					1	1	1
ENG 2 AFT NACELLE	14020	3					1	1	1
ENG 2 NOZZLE	14022	3					1	1	1

1 15 0 MASTER CAUTION SYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MASTER CAUTION (P)	15001	3					1	2	2
RLC (P)	15003	3					1	2	2
ANTI-ICE (P)	15004	3					1	2	2
FUEL (P)	15005	3					1	2	2
OVERHEAD ANN(P)	15006	3					1	2	2
ELECTRICAL (P)	15007	3					1	2	2
HYDRAULIC (P)	15008	3					1	2	2
CENTER AISLE (P)	15009	3					1	2	2
EFIS (P)	15010	3					1	2	2
CAUTION RECALL(P)	15011	3					1	2	2
MASTER CAUTION (C)	15002	3					1	2	2
RLC (C)	15013	3					1	2	2
ANTI-ICE (C)	15014	3					1	2	2
FUEL (C)	15015	3					1	2	2
OVERHEAD ANN(C)	15016	3					1	2	2
ELECTRICAL (C)	15017	3					1	2	2
HYDRAULIC (C)	15018	3					1	2	2
CENTER AISLE (C)	15019	3					1	2	2
EFIS (C)	15020	3					1	2	2
CAUTION RECALL(C)	15021	3					1	2	2

1 15 0 FLIGHT CTL/AVIONICS SUBSYSTEM INPUT

SIGNAL NAME	SIGNO	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
TOTAL AIR TEMP.	16027	7					11	2	22
STATIC AIR TEMP.	16030	7					11	2	22
ADC FAIL	27110	1	0 OR 5 VDC	NA	0VDC=ADC OK 5VDC=ADC FAIL	NA	1	8	8
EFCS WARNING (P)	16033	3					1	8	8
EFCS WARNING (C)	16036	3					1	8	8
AIR SPEED	16015	5					11	8	88
AIR SPEED	16016	5					11	8	88
VERTICAL VELOCITY	16022	5					11	8	88
MACH	16014	10					16	8	128
ALTIMETER	16020	10					16	8	128
TRUE AIRSPEED	27111	5		NA		1 KNOT	11	32	352
BAROMETRIC ALT	27112	5	0 TO 4 VDC	118 KTS TO 600KT	12.75 FAIL/MV	25 FEET	11	32	352
MACH OUTPUT	27113	5	0 TO 4 VDC	1000 TO 50000 FT	0.19M/VOLT	+-.002M/10.5MV	11	32	352
AIR SPEED	28092	5	0 TO +2.2 VDC	0 TO -2.2 DEG	1VDC/1DEG	0.5 %	11	32	352
GROUND	28093	5	0 TO +15 VDC	0 TO 699 KTS	150MV/7KTS	0.5 %	11	32	352
AIR SPEED	28217	5	0 TO +2.2 VDC	0 TO -2.2 DEG	1VDC/1DEG	0.5 %	11	32	352
GROUND	28218	5	0 TO +15 VDC	0 TO 699 KTS	150MV/7KTS	0.5 %	11	32	352
TRUE AIR SPEED	16024	9					14	32	448
CM AIR DA CPR OUT 1	25037	10					32	32	1024
TOTAL AIR TEMP.	16028	7					11	2	22
STATIC AIR TEMP.	16031	7					11	2	22
EFCS WARNING (C)	16034	3					1	8	8
EFCS WARNING (P)	16037	3					1	8	8
AIR SPEED	16018	5					11	8	88
AIR SPEED	16019	5					11	8	88
VERTICAL VELOCITY	16023	5					11	8	88
MACH	16017	10					16	8	128
ALTIMETER	16021	10					16	8	128

1 15 0 FLIGHT CTL/AVIONICS SUBSYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
TRUE AIR SPEED	16025	9					14	32	448
TOTAL AIR TEMP.	16029	7					11	2	22
STATIC AIR TEMP.	16032	7					11	2	22
EFCS [illegible] (P)	16035	3					1	8	8
EFCS [illegible] (C)	16038	3					1	8	8
TRUE AIR SPEED	16026	9					14	32	448

1 15 0 FLIGHT CTL/AVIONICS SUBSYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
[illegible] 1	16003	10					80	32	2560
[illegible] 2	16006	10					80	32	2560
[illegible] 3	16039	10					80	32	2560

2 1 0 LONG RANGE RADAR....AN/APQ-122

INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
DATA AC (TRUE&COMP)	27092	10	0 OR 5 VDC	NA		NA	160	32	5120
DATA AD (TRUE&COMP)	27093	10	0 OR 5 VDC	NA		NA	160	32	5120
DATA AC ID TRUE&COM	27094	10	0 OR 5 VDC	NA		NA	16	32	512
DATA AD ID TRUE&COM	27095	10	0 OR 5 VDC	NA		NA	16	32	512
DATA KEY TRUE&COMP	27096	10	0 OR 5 VDC	NA		NA	16	32	512
DATA RDY TRUE&COMP	27097	10	0 OR 5 VDC	NA		NA	16	32	512
50/10 LAMP RTN	21163	3					1	4	4
10/2 LAMP RTN	21164	3					1	4	4
3-[illegible]/5 LAMP RTN	21165	3					1	4	4
3-[illegible]/1 LAMP RTN	21166	3					1	4	4
24/[illegible] LAMP RTN	21167	3					1	4	4
[illegible] LAMP RTN	21169	3					1	4	4
TF RELIABILITY	24057	1	OPEN OR +0.380 VDC	NA	OPEN=TF OK .380VDC=TF NO OK	NA	1	32	32
TF RELIABILITY	28193	1	OPEN OR +0.380 VDC	NA	OPEN=TF OK .380VDC=TF NO OK	NA	1	32	32
SET RANGE	28037	4	OPEN OR 28VDC	NA	OPEN=NO RANGE 28VDC=RANGE	NA	1	32	32
SET RANGE TEST	28038	4	OPEN OR 28VDC	NA	OPEN=NO TEST 28VDC=TEST	NA	1	32	32
SET [illegible] TEST	28173	4	OPEN OR 28VDC	NA	OPEN=NO RANGE 28VDC=RANGE	NA	1	32	32
TF RELIABILITY	28192	5	0 TO +2.2 VDC	0 TO +2.2 DEG	1VDC/DEG	NA	11	32	352
SERVO FAILED	21074	5					11	8	88
AZIMUTH POS (X,Y,Z)	21043	9	0 TO 11.0 VAC				14	64	896

2 1 0 LONG RANGE RADAR....AN/APQ-122

SIGNAL NAME	DIGIT	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	R/R
[illegible]	21075	3	0 VDC				1	4	4
[illegible]	21076	3	0 VDC				1	4	4
[illegible] SEL GND	21077	3	0 VDC				1	4	4
[illegible] SEL GND	21078	3	0 VDC				1	4	4
[illegible] SEL GND	21079	3	0 VDC				1	4	4
WEATHER [illegible]	21080	3	0 VDC				1	4	4
[illegible]	21081	3	0 VDC				1	4	4
[illegible]	21082	3	0 VDC				1	4	4
[illegible]	[illegible]	3	0 VDC				1	4	4
[illegible] HEADING	21115	3					1	4	4
[illegible] SEL	21084	5	+3.9 TO -3.9 VDC				11	4	44
[illegible] RANGE	21085	5					11	16	176
[illegible]	21086	5					11	16	176
[illegible]	21087	5					11	16	176
[illegible]	21089	3	0 VDC				1	4	4
[illegible]	21091	3	0 VDC				1	4	4
RANGE SEL [illegible]	21101	3					1	4	4
RANGE SEL [illegible]	21102	3					1	4	4
RANGE SEL 50/10	21103	3					1	4	4
RANGE SEL 100/20	21104	3					1	4	4
RANGE SEL 240/30	21105	3					1	4	4
[illegible] MODE	21108	3					1	4	4
WEATHER MODE	21109	3					1	4	4
[illegible]	21169	3					1	4	4
[illegible] DELAY	21119	1	+5 VDC				1	8	8
ISO-ECHO LEVEL	21152	3					11	8	88
[illegible] MARK [illegible]	21146	5	+4.3 VDC TO 0				11	8	88
[illegible] INTENSITY	21147	5	+3.0 VDC TO 0						

2 1 0 LONG RANGE RADAR....AN/APQ-122

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	OUTPUT RESOLUTION	QUAN	U/R	B/R
ISO-ECHO	21149	5					11	8	88
VIDEO GAIN	21151	5	-15 VDC TO 0				11	8	88
RANGE MARK INTENS	21152	5	+4.3 VDC TO 0				11	8	88
3-[illegible] TC LEVEL	21141	7					11	8	88
NORTH STABILITY	21054	3					1	2	2
FULL HIGH/[illegible] CMD	21064	3	[illegible]6 VDC				1	2	2
SCAN MODE (LEFT)	21067	3	28 VDC				1	2	2
SCAN MODE (RIGHT)	21068	3	28 VDC				1	2	2
TRACK STAB	21063	3	5 VDC				1	32	32
SECTOR WIDTH SIN	21045	8	-1.2V TO +1.2 VAC				11	32	352
SECTOR WIDTH COS	21046	6	0 TO 2.2 VAC				11	32	352
AZIM POS (SIN/COS)	21044	18	0 TO 18 VDC				14	32	448
[illegible] CMD	21020	4	0 TO 26 VDC				1	2	2
TILT CONTROL(X,Y,Z)	21016	9					14	16	224

2 . 8 . 0 RADAR ALTIMETERS....AN/APN-141 (2) INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MODIFIED RELIABILIT	23028	1	0 OR 5 VDC		0VDC=OK 5VDC=FAIL	NA	1	32	32
LINEARIZED ALTITUDE	23031	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	7 FEET	11	32	352
LINEARIZED ALTITUDE	23032	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	7 FEET	11	32	352
RADAR ALTITUDE	28027	5	0 TO +25 VDC	0 TO 5,000 FT	35MV/7FEET	7 FEET	11	32	352
MODIFIED RELIABILIT	23066	1	0 TO 5 VDC		0VDC=OK	NA	1	32	32
LINEARIZED ALTITUDE	23069	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	FEET	11	32	352
LINEARIZED ALTITUDE	23070	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	FEET	11	32	352
RADAR ALTITUDE	28163	5	0 TO +25 VDC	0 TO 5,000 FT	35MV/7FEET	7 FEET	11	32	352

2 3 0 RADAR ALTIMETERS....AN/APN-141 (2)

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SELF TEST	23013	3	GROUND	NA	OPEN=NO SELF TST GND=SELF TST INI	NA	1	8	8

2 3 0 MAGNETIC COMPASS....C-12

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
PILOT HSI (F)		24028	9					14	8	112
PILOT BDHI	B	24119	9					14	8	112
COPILOT HSI (F)		24149	9					14	8	112
COPILOT BDHI B		24219	9					14	8	112

2 5 6 INERTIAL NAVIGATION SYSTEM INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HEADS UP DISPL IN 1	25015	10					208	2	416
MAG HEADING [illegible]	25029	1	+28 VDC		28VDC=TRUE		1	4	4
RANGE TO DEST UNITS	25023	9		0/9		1/2 MILE PR	14	4	56
RANGE TO DEST TENS	25024	9		0/90			14	4	56
RANGE TO DEST [illegible]	25025	9		0/900			14	4	56
DEST REL BEARING	25026	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
MAG HEADING	25027	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
ATTITUDE GOOD	25022	1	A/C+28 VDC		28VDC=TRUE		1	8	8
[illegible]	26002	16					32	16	512
STEERING ERROR	25030	5		+-10 DEG	150 UA/10 DEG	1/16 DISP	11	32	352
ROLL	25018	9		0/360 DEG	1DEG=1DEG	0.1 DEG RMS	14	32	448
PITCH	25021	9		+-90 DEG	1DEG=1DEG	0.1 DEG RMS	14	64	896

2 5 0 INERTIAL NAVIGATION SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
INS POWER ON	25009	1			GND=TRUE		1	2	2
ATTITUDE MODE	25010	1	28 VDC		28VDC=TRUE		1	2	2
FL CTL NV PNL OUT 1	25002	10					64	8	512
CM AIR DA CPH OUT 1	25007	10					32	32	1024

2 5 0 OMEGA NAVIGATION SYSTEM

INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
OMEGA DISPLAY(P)	26003	10					192	2	384
OMEGA DISPLAY(C)	26004	10					192	2	384

2 5 0 OMEGA NAVIGATION SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
OMEGA SYSTEM OK	26005	4					1	8	8
HEADING/GMT	26002	10					32	16	512
TRUE AIRSPEED	26001	9					14	16	224

3 2 0 HF/SSB RADIO....AN/ARC-123

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	P/R
RT 51[illegible]	32026	2	-5 VDC/+10 VDC		-5VDC=R/+10VDC=X		1	2	2
RT 1[illegible]	32027	2	+10 VDC/-5 VDC		-5VDC=R/+10VDC=X		1	2	2

5 2 0 HF/SSB RADIO....AN/ARC-123

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ANT CPLR BAND 1	32001	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 2	32002	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 3	32003	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 4	32004	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 5	32005	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 6	32006	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 7	32007	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 8	32008	3	GND/OPEN		GND=1/OPEN=0		1	2	2
RECHANNEL PULSE	32031	2	+10 VDC/GND				1	2	2
BIT OUTPUT	32037	2	+10 VDC/0 VDC		+10VDC=1/0VDC=0		1	2	2
AMP/PS BAND 1	32009	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 2	32010	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 3	32011	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 4	32012	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 5	32013	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 6	32014	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 7	32015	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 8	32016	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 9	32017	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 10	32018	3	GND/OPEN		GND=1/OPEN=0		1	2	2
SSB	32019	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AME	32020	3	GND/OPEN		GND=1/OPEN=0		1	2	2
FSK	32021	3	GND/OPEN		GND=1/OPEN=0		1	2	2
CW	32038	3	GND/OPEN		GND=1/OPEN=0		1	2	2
GUARDBAND A BANDSW	32040	3	GND/OPEN				1	2	2
GUARDBAND B BANDSW	32041	3	GND/OPEN				1	2	2
PANEL LIGHTS	32022	4	OPEN/-5 VDC		-5VDC=1/OPEN=0		1	2	2
NOISE BLKR CONTROL	32028	5	+10 VDC/-5 VDC				11	2	22

3 2 0 HF/SSB RADIO....AN/ARC-123

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HF GAIN CONTROL	32029	5	+10 VDC/-5 VDC				11	2	22
SQUELCH CONTROL	32030	5	+10 VDC/-5 VDC				11	2	22
V[illegible]ED T[illegible] VOLTGE	32033	5	+11 VDC/+35 VDC				11	2	22
FA[illegible]D TNG VOLTGE	32034	5	+11 VDC/+35 VDC				11	2	22
VOLUME CONTROL	32035	6	-5 VDC/0 VDC				11	2	22

AD-A083 113 BOEING AEROSPACE CO SEATTLE WA BOEING MILITARY AIRPL--ETC F/G 9/2
COMPUTER PROGRAM DEVELOPMENT SPECIFICATION FOR IDAMST OPERATION--ETC(U)
NOV 76 F33615-76-C-1099
UNCLASSIFIED SPEC-SB-4042 AFAL-TR-76-208-ADD-2 NL

3 OF 3
AD-
A083113

END
DATE
FILMED
5 80
DTIC

3 3 0 VHF/FM RADIO....FM-622

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR (OUTPUT)	RESOLUTION	QUAN	U/R	B/R
TONE SQUELCH GROUND	33001	3	OPEN OR GROUND	NA	OPEN=NO SQUELCH GND=SQUELCH	NA	1	8	8
SQUELCH DISABLE GND	33002	3	OPEN OR GROUND	NA	OPEN=NO DISABLE GND=DISABLE	NA	1	8	8
0.05 MC SELECT E	33005	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT D	33006	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT C	33007	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT B	33008	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT A	33009	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
BAND A 30-52 MC	33010	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
BAND B 53-76 MC	33011	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT E	33012	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT C	33013	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT D	33014	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT B	33015	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT A	33016	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
NB/WB CONT	33031	3	OPEN OR GROUND	NA	OPEN=NARROW GND=WIDE	NA	1	8	8
VHF PRESS-TO-TALK	33033	3	OPEN OR GROUND	NA	NA	NA	1	8	8

3 4 0 VHF/AM RADIO....WILCOX 807

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
10MHZ FREQ SEL 2**4	34001	1	0/1				1	2	2
10MHZ FREQ SEL 2**3	34002	1	0/1				1	2	2
10MHZ FREQ SEL 2**2	34003	1	0/1				1	2	2
10MHZ FREQ SEL 1**1	34004	1	0/1				1	2	2
1MHZ FREQ SEL 2**5	34005	1	0/1				1	2	2
1MHZ FREQ SEL 2**4	34006	1	0/1				1	2	2
1MHZ FREQ SEL 2**3	34007	1	0/1				1	2	2
1MHZ FREQ SEL 2**2	34008	1	0/1				1	2	2
1MHZ FREQ SEL 2**1	34009	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**5	34010	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**4	34011	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**3	34012	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**2	34013	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**1	34014	1	0/1				1	2	2
0.01MHZ FQ SEL 2**5	34015	1	0/1				1	2	2
0.01MHZ FQ SEL 2**4	34016	1	0/1				1	2	2
0.01MHZ FQ SEL 2**3	34017	1	0/1				1	2	2
0.01MHZ FQ SEL 2**2	34018	1	0/1				1	2	2
0.01MHZ FQ SEL 2**1	34019	1	0/1				1	2	2
0.005MHZ FQSEL 2**2	34020	1	0/1				1	2	2
0.005MHZ FQSEL 2**1	34021	1	0/1				1	2	2
FREQ SEL COMM	34022	3	GND/OPEN				1	2	2
SQ DISABLE COMM TST	34023	3	GND/OPEN				1	2	2
REMOTE ON/OFF	34024	4	0/27.5 VDC				1	2	2

3 5 0 INTERCOMMUNICATION SET

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
PUSH-TO-TALK	34025	3	GND/OPEN				1	2	2
UHF RADIO CNTRL	36043	3	OPEN 28V CLO GND				1	8	8

3 6 0 INTERCOMMUNICATION SET

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
CONTROL POS 5(UHF R	36006	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS3(VHF/AM)	36007	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS7	36008	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS4(HF/SSH)	36009	3	OPEN 28 V CLO GND				1	4	4
CONTL POS1 (SPARE)	36030	3	OPEN 28V CLO GND				1	4	4
CONTROL POS 5(UHF R	36057	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 3 (VHF/AM	36060	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 7	36061	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 4 (HF/SSB	36062	3	OPEN 28V CLO GND				1	4	4
CONTL POS2(VHF/FM)	36075	3	OPEN 28V CLO GND				1	4	4
CONTL POS1 (SPARE)	36054	3	OPEN 28V CLO GRD				1	4	4
IC 1 CALL CNTRL	36005	4	28 V				1	4	4
ICS 2 CALL CNTRL	36056	4	28 V				1	4	4

3 * 0 UHF RADIO....AN/ARC-164 OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SQUELCH DISABLE	39017	3					1	2	2
W/N	39018	3					1	2	2
POWER ON/OFF	39019	3					1	2	2
TONE KEY	39013	3					1	4	4
ADF ENABLE	39014	3					1	4	4
GUARD ON/OFF	39022	3					1	4	4
KY/GUARD INTLK OUT	39024	3					1	4	4
KY/GUARD INTLK IN	39025	3					1	4	4
PRESET FREQ READ	39026	3					1	4	4
XMT/ADF INTLOCK	39016	4					1	4	4
XMT KEY	39021	3					1	8	8
MAIN SQUELCH ADJ HI	39003	6					11	8	88
MAIN SQUELCH ADJ CT	39004	6					11	8	88
GUARD SQ ADJ HI	39005	6					11	8	88
GUARD SQ ADJ CT	39006	6					11	8	88
SQUELCH DISABLE	39064	3					1	2	2
W/N	39065	3					1	2	2
POWER ON/OFF	39066	3					1	2	2
TONE KEY	39060	3					1	4	4
ADF ENABLE	39061	3					1	4	4
GUARD ON/OFF	39069	3					1	4	4
KY/GUARD INTLK OUT	39071	3					1	4	4
KY/GUARD INTLK IN	39072	3					1	4	4
PRESET FREQ READ	39073	3					1	4	4
XMT/ADF INTLOCK	39063	4					1	4	4
XMT KEY	39068	3					1	8	8
MAIN SQUELCH ADJ HI	39050	6					11	8	88
MAIN SQUELCH ADJ CT	39051	6					11	8	88

3 9 0 UHF RADIO....AN/ARC-164

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
GUARD SQ ADJ HI	39052	6					11	8	88
GUARD SQ ADJ CT	39053	6					11	8	88

* 1 0 INSTRUMENT LANDING SYSTEM....AN/APN-105 (2) INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
400 HZ MARKER BEACN	41069	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41070	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41071	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41075	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41076	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41077	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41017	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300 HZ MKR BEACON	41018	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000 HZ MKR BEACON	41019	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41078	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41079	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41080	3	GND/OPEN		GND=1/OPEN=0		1	8	8
LOC INST DEVIATION	41025	6					11	32	352
LOC FLAG OUTPUT	41026	6					11	32	352
GS INSTR DEVIATION	41027	6					11	32	352
GS FLAG OUTPUT	41028	6					11	32	352
LOC DEVIATION	41029	6					11	32	352
GS DEVIATION	41030	6					11	32	352
LOC FLAG OUTPUT	41031	6					11	32	352
GS FLAG OUTPUT	41032	6					11	32	352
LOC DEVIATION	41033	6					11	32	352
GS DEVIATION	41034	6					11	32	352
400 HZ MARKER BEACN	41072	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41073	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41074	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41051	3	GND/OPEN		GND=I/OPEN=0		1	8	8
1300 HZ MKR BEACN	41052	3	GND/OPEN		GND=I/OPEN=0		1	8	8
3000 HZ MKR BEACON	41053	3	GND/OPEN		GND=I/OPEN=0		1	8	8

4 1 0 INSTRUMENT LANDING SYSTEM....AN/APN-108 (2) INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
400 HZ MARKER BEACN	41051	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41082	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41083	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41084	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41085	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41086	3	GND/OPEN		GND=1/OPEN=0		1	8	8
LOC INST DEVIATION	41059	6					11	32	352
LOC FLAG OUTPUT	41060	6					11	32	352
GS INSTR DEVIATION	41061	6					11	32	352
GS FLAG OUTPUT	41062	6					11	32	352
LOC DEVIATION	41067	6					11	32	352
GS DEVIATION	41068	6					11	32	352
LOC DEVIATION	41063	6					11	32	352
GS DEVIATION	41064	6					11	32	352
LOC FLAG OUTPUT	41065	6					11	32	352
GS FLAG OUTPUT	41066	6					11	32	352

4 1 0 INSTRUMENT LANDING SYSTEM....AN/APN-10A (2) OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
1MHZ FREQ SEL B	41008	3	GND/OPEN		GND=1/OPEN=0		1	2	2
1MHZ FREQ SEL E	41009	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL A	41010	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL B	41011	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL E	41012	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.01MHZ FREQ SEL C	41013	3	GND/OPEN		GND=1/OPEN=0		1	2	2
1MHZ FREQ SEL D	41042	3	GND/OPEN		GND=1/OPEN=0		1	2	2
1MHZ FREQ SEL E	41043	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL A	41044	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL B	41045	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL E	41046	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.01MHZ FREQ SEL C	41047	3	GND/OPEN		GND=1/OPEN=0		1	2	2

4 2 0 LF AUTOMATIC DIRECTION FINDER....DF-206 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
BRG DATA 4	42036	9					14	8	112
BRG DATA 5	42037	9					14	8	112

4 3 0 INTRAFORMATION POSITIONING SET....AN/APN-169A INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LAMP TEST GROUND	43015	3					1	1	1
LAMP TEST GROUND	43016	3					1	1	1
LAMP TEST GROUND	43017	3					1	1	1
REC LEFT TURN LP G	43075	3	+5 VDC		GND=1/OPEN=0		1	1	1
REC SLOWDOWN LP GND	43076	3	+5 VDC				1	1	1
REC LETDOWN LP GND	43077	3	+5 VDC				1	1	1
REC EXECUTE LP GND	43078	3	+5 VDC				1	1	1
REC PULLUP LP GND	43079	3	+5 VDC				1	1	1
REC SPEED UP LP GND	43080	3	+5 VDC		GND=1/OPEN=0		1	1	1
REC RIGHT TURN LP G	43081	3	+5 VDC		GND=1/OPEN=0		1	1	1
LEGEND DIM HI	43012	4	5 VDC				1	1	1
MASTER LAMP GND	43070	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
MASTER LOSTLAMP GND	43071	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
CAUTION LAMP GND	43072	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
PROXIMITY WRNG LP G	43073	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
LEGEND DIM	43011	5	0 TO 5 VDC				11	1	11
LEGEND DIM	43053	5	0 TO 25 VDC				11	1	11
LEGEND DIM	43054	5	0 TO 28 VDC				11	1	11
TWO INSLOT LCG	43001	3	0 TO 5 VDC				1	2	2
TWO MASTER LCG	43002	3	0 TO 5 VDC				1	2	2
NO GO LCG	43003	3	0 TO 5 VDC				1	2	2
MASTER LAMP LCG	43004	3	0 TO 5 VDC				1	2	2
MASTER LAMP LCG	43005	3	0 TO 5 VDC				1	2	2
XMIT RTTURN LP CTL	43086	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT SPEEDUP LP CTL	43088	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT PULLUP LP CTL	43090	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT EXECUTE LP CTL	43092	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT LETDOWN LP CTL	43094	3	5 VDC		GND=1/OPEN=0		1	2	2

4 3 0 INTRAFORMATION POSITIONING SET....AN/APN-169A INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
XMIT SLOWDOWN LP CTL	43096	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT LETDOWN LP CTL	43098	3	5 VDC		GND=1/OPEN=0		1	2	2
ALTITUDE REFERENCE	43111	5	0 TO 5.5 VDC				11	2	22
RAMP RATE ANA CONT	43043	5	0 TO 22 VDC				11	8	88
DIFF ALTITUDE OTPT	43112	5					11	32	352
DOUBLET SIGNAL	43032	6					11	32	352

4 3 0 INTRAFORMATION POSITIONING SET....AN/APN-169A OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LNG GEAR SW(AUSS)	43146	3					1	1	1
LAMP TEST GROUND	43015	3					1	1	1
LAMP TEST GROUND	43014	3					1	1	1
FREQ A POSN	43027	3			GND=1/OPEN=0		1	1	1
FREQ B POSN	43028	3			GND=1/OPEN=0		1	1	1
RELAY RETURN	43029	3			GND=1/OPEN=0		1	1	1
16K FT/RANGE MARK	43044	3	OPEN & GND				1	1	1
8K FT/RANGE MARK	43045	3	OPEN & GND				1	1	1
4K FT/RANGE MARK	43046	3	OPEN & GND				1	1	1
2K FT/RANGE MARK	43047	3	OPEN & GND				1	1	1
1K FT/RANGE MARK	43048	3	OPEN & GND				1	1	1
FREQUENCY A	43019	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
FREQUENCY B	43020	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
STBY SWTH POSITION	43021	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
MASTER SIGNAL	43022	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
FOLLOWER SIGNAL	43023	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
BITE TEST	43024	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
BITE TEST COMPL	43025	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
LEGEND DIM	43031	5	0 TO 5 VDC				11	1	11
RANGE MARK BRT CONT	43042	5	0 TO 5 VDC				11	1	11
RIGHTTURN SWITCH	43087	4	5 VDC		GND=1/5VDC=0		1	2	2
SPEEDUP SWITCH	43089	4	5 VDC		GND=1/5VDC=0		1	2	2
PULLUP SWITCH	43091	4	5 VDC		GND=1/5VDC=0		1	2	2
EXECUTE SWITCH	43093	4	5 VDC		GND=1/5VDC=0		1	2	2
LETDOWN SWITCH	43095	4	5 VDC		GND=1/5VDC=0		1	2	2
SLOWDOWN SWITCH	43097	4	5 VDC		GND=1/5VDC=0		1	2	2
LEFTTURN SWITCH	43099	4	5 VDC		GND=1/5VDC=0		1	2	2
AUDIO OFF	43139	3	0 VDC		GND=1/OPEN=1		1	2	2

4 3 0 INTRAFORMATION POSITIONING SET....AN/APN-169A OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
AUDIO RESET	43140	3	0 VDC		GND=1/OPEN=1		1	2	2
ID PUSHBUTTON	43105	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT08)	43106	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT04)	43107	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT02)	43108	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT01)	43109	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT10)	43110	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
ALTITUDE 100C	43113	4			5VDC=50"/GND=+,-		1	2	2
ALT OFFSET POLARITY	43114	4			5VDC=+,50/GND=-		1	2	2
TRACK OFFSET (X10K)	43118	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (X8K)	43119	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (X4K)	43120	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (X2K)	43121	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (X1K)	43122	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
LEFT/RIGHT SWITCH	43123	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y4K)	43124	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y2K)	43125	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y1K)	43126	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y200)	43127	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y400)	43128	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y800)	43129	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y100)	43130	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
LEADER SW (TT205)	43131	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
PROX WRNG SW(PW58)	43135	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
PROX WRNG SW(PW54)	43136	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
PROX WRNG SW(PW52)	43137	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
PROX WRNG SW(PW51)	43138	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
ALT OFFSET VOLTAGE	43115	5	+2.7 TO 5.1 VDC				11	2	22

* 3 0 INTRAFORMATION POSITIONING SET....AN/APN-169A

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
PHOTO PCKP OUTPT	43036	11					7	16	112
RANGE MARK	43037	11					7	16	112
SECTORING COMP OPT	43055	3					1	32	32
X DEFLECTION	43033	6					11	32	352
Y DEFLECTION	43034	6					11	32	352

4 5 0 TACAN.....AN/ARN-118

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RT STATUS FLAG	46039	1	0 TO +18-32V				1	1	1
DISTANCE FLAG	46056	1					1	1	1
PWR INTERLOCK OUT	46011	3					1	1	1
SERIAL DATA OUT	46053	10	+-12 VDC				128	8	1024

4 5 0 TACAN.....AN/ARN-118

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
TENARY CONTROL A	46007	10	+-5 VDC				32	16	512
TENARY CONTROL B	46008	10	+-5 VDC				32	16	512

4 7 0 HF AUTOMATIC DIRECTION FINDER....AN/ASF-73 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HF CONTROL ARM	47002	5					11	2	22
SYNCHRO H	47036	9					14	8	112
SYNCHRO X	47037	9					14	8	112
SYNCHRO Y	47038	9					14	8	112
SYNCHRO Z	47039	9					14	8	112
SYNCHRO C	47040	9					14	8	112
TUNING METER	47001	5					11	16	176

4 7 0 HF AUTOMATIC DIRECTION FINDER....AN/ADF-73

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
FUNCTION SEL ADF	47007	4	0 VDC/+10 VDC				1	2	2
C4/VOICE (BFO ON)	47025	4					1	2	2

4.9.0 UHF AUTOMATIC DIRECTION FINDER....AN/ARA-50 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ANTENNA BEARING	49042	9	11.8 VAC	0 TO 360 DEG	1DEG/DEG	12 ARC MIN	14	32	448
SENSITIVITY CONTROL	49004	3	OPEN OR GND	NA	OPEN=CONTROL GND=NO CONTROL	NA	1	8	8

4.8.6 UHF AUTOMATIC DIRECTION FINDER....AN/ARA-50

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ANTENNA SWITCHING	48017	3	OPEN OR GND	NA	OPEN=NO SWITCH GND=SWITCH	NA	1	8	8
ADF ENABLE	48021	3	OPEN OR GND	NA	OPEN=NO ENABLE GND=ENABLE	NA	1	8	8
ADF TIME CONSTANT	48008	3	OPEN OR GND	NA	OPEN=NO TC GND=TC	NA	1	8	8
POWER ON	48009	3	OPEN OR GND	NA	OPEN=NO POWER GND=POWER	NA	1	8	8
CHANNEL GUARD ON	48010	3	OPEN OR GND	NA	OPEN=NOT ON GND=ON	NA	1	8	8
CHANNEL SELECT LOGI	48012	4	OPEN OR 28 VDC	NA	OPEN=NOT SELECT 28VDC=SELECTED	NA	1	8	8
CHANNEL SELECT LOGI	48013	4	OPEN OR 28VDC	NA	OPEN=NOT SELECT 28VDC=SELECTED	NA	1	8	8

5 1 0 INFRARED DETECTION AND WARNING SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
QUAD IDENT	51010	1	+5 VDC		5VDC=1/GND=0		1	8	8
QUAD IDENT	51011	1	+5 VDC		5VDC=1/GND=0		1	8	8
HIGH-LOW THREAT ID	51012	1	+5 VDC		5VDC=1/GND=0		1	8	8
QUAD IDENT	51023	1	+5 VDC		5VDC=1/GND=0		1	8	8
QUAD IDENT	51024	1	+5 VDC		5VDC=1/GND=0		1	8	8
HIGH-LOW THREAT ID	51025	1	+5 VDC		5VDC=1/GND=0		1	8	8
TARGET ACQUISITION	51009	4	+5 VDC		5VDC=1/GND=0		1	8	8
TARGET ACQUISITION	51022	4	+5 VDC		5VDC=1/GND=0		1	8	8
DISPENSE FL ENABLE	52001	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY I	52002	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY III	52004	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY VI	52005	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY II	52003	4	+28 VDC - GND		28VDC=1/GND=0		1	33	33

5 1 0 INFRARED DETECTION AND WARNING SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
FLARE STATUS 1	51018	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 2	51019	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 3	51020	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 4	51021	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4

5 2 0 FLARES DISPENSER SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	P/R
FLARE STATUS 1	51018	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 2	51019	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 3	51020	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4
FLARE STATUS 4	51021	4	+28 VDC - GND		28VDC=1/GND=0		1	4	4

5 2 0 FLARES DISPENSER SYSTEM

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
DISPENSE FL ENABLE	52001	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY I	52002	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY III	52004	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY VI	52005	4	+28 VDC - GND		28VDC=1/GND=0		1	32	32
FLARE VOLLEY II	52003	4	+28 VDC - GND		28VDC=1/GND=0		1	33	33

5 5 0 RADAR HOMING AND WARNING SYSTEM...AN/APR-36/37 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
FUSE	53001	1	115 VAC	NA	OPEN OR 115 VAC	NA	1	2	2
FUSE	53092	1	115 VAC	NA	OPEN OR 115 VAC	NA	1	2	2
[illegible] LAMP	53003	3	115 VAC	NA	115 VAC OR OPEN	NA	1	2	2
ACTIVITY TEST	53004	2	25 VDC	NA	25 VDC OR GND	NA	1	2	2
LAUNCH TEST	53005	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
ACTIVITY(INDICATOR)	53006	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
LAUNCH(INDICATOR)	53007	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
ACTIVITY TEST	53061	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
ACTIVITY LAMP	53062	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH LAMP	53064	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH TEST	53066	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
ON LAMP	53079	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
SAFE	53060	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH LAMP	53065	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
PRIORITY LAMP	53067	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
OFF LAMP	5306A	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
UNKNOWN LAMP	53069	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
UNKNOWN LAMP	53070	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
GROUND	53071	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
REMOTE LAMP	53073	3	NA	NA	OPEN AND CLOSE	NA	1	2	2
TGT SEP	53074	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
S LAMP	53075	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
ACTIVITY LAMP	53076	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
LAMP	53077	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
SPARE	5307A	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
45 DEFLECTION	53096	5	0 TO 25 VDC	NA	NA	5	11	16	176
225 DEFLECTION	53087	5	0 TO 25 VDC	NA	NA	5	11	16	176
315 DEFLECTION	53088	5	0 TO 25 VDC	NA	NA	5	11	16	176

5 3 0 RADAR HOMING AND WARNING SYSTEM...AN/APR-36/37 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
135 DEFLECTION	53089	5	0 TO 25 VDC	NA	NA	5	11	16	176
45 DEFLECTION	53095	5	0 TO 25 VDC	NA	NA	5	11	16	176
225 DEFLECTION	53096	5	0 TO 25 VDC	NA	NA	5	11	16	176
315 DEFLECTION	53097	5	0 TO 25 VDC	NA	NA	5	11	16	176
135 DEFLECTION	53098	5	0 TO 25 VDC	NA	NA	5	11	16	176

5 . 0 RADAR HOMING AND WARNING SYSTEM...AN/APR-36/37

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
115V 400HZ	53002	3	115 VAC	NA	115 VAC OR OPEN	NA	1	2	2
DISABLE	53072	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2

7 1 0 INSTRUMENT AND AIRCRAFT SYSTEMS INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SELF TEST	23013	3	GROUND	NA	OPEN=NO SELF TST GND=SELF TST INI	NA	1	8	8
SELF TEST	23015	3	GROUND	NA	OPEN=NO SELF TST GND=SELF TST INI	NA	1	8	8
SELF TEST	23053	3	GROUND	NA	OPEN=NO SELF TST	NA	1	8	8

7 1 0 INSTRUMENT AND AIRCRAFT SYSTEMS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	OUTPUT RESOLUTION	QUAN	U/R	B/R
AIR SPEED	16015	5					11	8	88
AIR SPEED	16016	5					11	8	88
MACH	16014	10					16	8	128
AIR SPEED	16018	5					11	8	88
AIR SPEED	16019	5					11	8	88
MACH	16017	10					16	8	128
VERTICAL VELOCITY	16022	5					11	8	88
VERTICAL VELOCITY	16023	5					11	8	88
ALTIMETER	16020	10					16	8	128
ALTIMETER	16021	10					16	8	128
EFCS WARNING (P)	16033	3					1	8	8
EFCS WARNING (C)	16034	3					1	8	8
EFCS WARNING (P)	16035	3					1	8	8
EFCS WARNING (C)	16036	3					1	8	6
EFCS WARNING (P)	16037	3					1	8	8
EFCS WARNING (C)	16038	3					1	8	8

7 4 0 RADIO AIDS TO NAVIGATION SYSTEM OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
400 HZ MARKER BEACN	41072	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41073	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41074	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41069	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41070	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41071	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41051	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300 HZ MKR BEACN	41052	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000 HZ MKR BEACON	41053	3	GND/OPEN		GND=1/OPEN=0		1	8	8

9 1 0 ICAMST PROCESSOR 1

INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
INS POWER ON	25009	1			GND=TRUE		1	2	2
[illegible]	25010	1	28 VDC		28VDC=TRUE		1	2	2
28 VDC RPC CTL 111	13001	1					1	8	8
28 VDC RPC CTL 114	13003	1					1	8	8
28 VDC RPC CTL 116	13005	1					1	8	8
28 VDC RPC CTL 115	13007	1					1	8	8
28 VDC RPC CTL 117	13009	1					1	8	8
28 VDC RPC CTL 123	13011	1					1	8	8
28 VDC RPC CTL 126	13013	1					1	8	8
28 VDC RPC CTL 1111	13015	1					1	8	8
28 VDC RPC CTL 1112	13017	1					1	8	8
28 VDC RPC CTL 1112	13019	1					1	8	8
28 VDC RPC CTL 1112	13021	1					1	8	8
28 VDC RPC CTL 1113	13023	1					1	8	8
28 VDC RPC CTL 1113	13025	1					1	8	8
28 VDC RPC CTL 1113	13027	1					1	8	8
28 VDC RPC CTL 1122	13029	1					1	8	8
28 VDC AXM RPC CTL	13031	1					1	8	8
28 VDC N1 RPC CTL	13033	1					1	8	8
28 VDC N2 RPC CTL	13035	1					1	8	8
28 VDC EST RPC CTL	13037	1					1	8	8
28 VDC UTL RPC CTL	13039	1					1	8	8
28 VDC CTL RPC CTL	13041	1					1	8	8
28 VDC FF RPC CTL	13043	1					1	8	8
28 VDC AXM RPC CTL	13045	1					1	8	8
28 VDC N1 RPC CTL	13047	1					1	8	8
28 VDC N2 RPC CTL	13049	1					1	8	8
28 VDC EST RPC CTL	13051	1					1	8	8

8 1 0 IDAMST PROCESSOR 1 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
28 VDC OIL RPC CTL	13053	1					1	8	8
28 VDC OIL RPC CTL	13055	1					1	8	8
28 VDC FF RPC CTL	13057	1					1	8	8
3PH 115VAC RPC CTL	13059	1					1	8	8
28 VDC RPC CTL 210	13061	1					1	8	8
26 VAC RPC CTL 210	13063	1					1	8	8
3PH 115VAC RPC CTL	13065	1					1	8	8
3PH 115VAC RPC CTL	13067	1					1	8	8
3PH 115VAC RPC CTL	13069	1					1	8	8
28 VDC RPC CTL 230	13073	1					1	8	8
3PH 115VAC RPC CTL	13071	1					1	8	8
28 VDC RPC CTL 230	13075	1					1	8	8
3PH 115VAC RPC CTL	13077	1					1	8	8
26 VAC RPC CTL 240	13079	1					1	8	8
28 VDC RPC CTL 240	13081	1					1	8	8
3PH 115VAC RPC CTL	13083	1					1	8	8
28 VDC RPC CTL 250	13085	1					1	8	8
26 VAC RPC CTL 250	13087	1					1	8	8
3PH 115VAC RPC CTL	13089	1					1	8	8
28 VDC RPC CTL 260	13091	1					1	8	8
28 VDC RPC CTL 311	13093	1					1	8	8
3PH 115VAC RPC CTL	13095	1					1	8	8
28 VDC RPC CTL 330	13097	1					1	8	8
28 VDC RPC CTL 340	13099	1					1	8	8
28 VDC RPC CTL 360	13101	1					1	8	8
28 VDC RPC CTL 370	13103	1					1	8	8
28 VDC RPC CTL 380	13105	1					1	8	8
115 VAC RPC CTL 380	13107	1					1	8	8

a 1 0 IDAMST PROCESSOR 1

INPUT

SIGNAL NAME	SICID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
28 VDC RPC CTL 391	13109	1					1	8	8
28 VDC RPC CTL 392	13111	1					1	8	8
28 VDC RPC CTL 411	13113	1					1	8	8
28 VDC RPC CTL 4111	13115	1					1	8	8
28 VDC RPC CTL 420	13117	1					1	8	8
26 VAC RPC CTL 420	13119	1					1	6	8
3PH 115VAC RPC CTL	13121	1					1	8	8
28 VDC RPC CTL 430	13123	1					1	8	8
28 VDC RPC CTL 450	13125	1					1	8	8
28 VDC RPC CTL 460	13127	1					1	5	8
26 VAC RPC CTL 460	13129	1					1	8	8
115VAC RPC CTL 460	13131	1					1	8	8
28 VDC RPC CTL 470	13133	1					1	8	8
28 VDC RPC CTL 450	13135	1					1	8	8
26 VAC RPC CTL 460	13137	1					1	8	8
115VAC RPC CTL 460	13139	1					1	8	8
28 VDC RPC CTL 511	13141	1					1	8	8
28 VDC RPC CTL 512	13143	1					1	8	8
28 VDC RPC CTL 513	13145	1					1	8	8
28 VDC RPC CTL 514	13147	1					1	8	8
28 VDC RPC CTL 520	13149	1					1	8	8
115VAC RPC CTL 531	13151	1					1	8	8
28 VDC RPC CTL SCP	13153	1					1	8	8
115VAC RPC CTL IMK	13155	1					1	8	8
115VAC RPC CTL IMK	13157	1					1	8	8
28 VDC RPC CTL IMK	13159	1					1	8	8
28 VDC RPC CTL IMK	13161	1					1	8	8
3PH 115VAC RPC CTL	13163	1					1	8	8

A 1 0 IDAMST PROCESSOR 1 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
28 VDC RPC CTL DEK	13165	1					1	8	8
28 VDC RPC CTL DEK	13167	1					1	8	8
28 VDC RPC CTL MMK	13169	1					1	8	8
28 VDC RPC CTL SYM	13171	1					1	8	8
3PH 115VAC RPC CTL	13173	1					1	8	8
3PH 115VAC RPC CTL	13175	1					1	8	8
3PH 115VAC RPC CTL	13177	1					1	8	8
3PH 115VAC RPC CTL	13179	1					1	8	8
3PH 115VAC RPC CTL	13181	1					1	8	8
3PH 115VAC RPC CTL	13183	1					1	8	8
3PH 115VAC RPC CTL	13185	1					1	8	8
3PH 115VAC RPC CTL	13187	1					1	8	8
3PH 115VAC RPC CTL	13189	1					1	8	8
3PH 115VAC RPC CTL	13191	1					1	8	8
28 VDC RPC CTL MFDC	13193	1					1	8	8
28 VDC RPC CTL HND	13195	1					1	8	8
26 VAC RPC CTL HND	13197	1					1	8	8
115VAC RPC CTL IMK	13199	1					1	8	8
115VAC RPC CTL IMK	13201	1					1	8	8
28 VDC RPC CTL IMK	13203	1					1	8	8
28 VDC RPC CTL IMK	13205	1					1	8	8
3PH 115VAC RPC CTL	13207	1					1	8	8
28 VDC RPC CTL LEK	13209	1					1	8	8
28 VDC RPC CTL LEK	13211	1					1	8	8
28 VDC RPC CTL MMK	13213	1					1	8	8
3PH 115VAC RPC CTL	13215	1					1	8	8
3PH 115VAC RPC CTL	13217	1					1	8	8
3PH 115VAC RPC CTL	13219	1					1	8	8

F 1 0 IDAMST PROCESSOR 1 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
3PH 115VAC RPC CTL	13221	1					1	3	8
3PH 115VAC RPC CTL	13223	1					1	8	8
3PH 115VAC RPC CTL	13225	1					1	8	8
3PH 115VAC RPC CTL	13227	1					1	8	8
3PH 115VAC RPC CTL	13229	1					1	8	8
3PH 115VAC RPC CTL	13231	1					1	8	8
3PH 115VAC RPC CTL	13233	1					1	8	8
3PH 115VAC RPC CTL	13235	1					1	8	8
28 VDC RPC CTL PROC	13237	1					1	8	8
FL CTL ON PNL OUT 1	25002	10					64	8	512
MISSION RCDR(IN)	80169	10					32	8	256
DITS RECORDER(IN)	80171	10					512	8	4096

A I O   ICAMST PROCESSOR 1

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LDG GEAR DR POS-N1	1009	3					1	1	1
LDG GEAR DR POS-N2	1010	3					1	1	1
LDG GEAR DR POS-L1	1011	3					1	1	1
LDG GEAR DR POS-L2	1012	3					1	1	1
ANTI SKID	10001	3					1	1	1
BRAKE LOW PRESS	10002	3					1	1	1
AUTO BRAKE FSAFE	10003	3					1	1	1
LE FLP EXT AR	11009	3					1	1	1
LE FLP EXT FR	11010	3					1	1	1
LE FLP EXT AL	11011	3					1	1	1
LE FLP EXT FL	11012	3					1	1	1
LE FLP INT AR	11013	3					1	1	1
LE FLP INT FR	11014	3					1	1	1
LE FLP INT AL	11015	3					1	1	1
LE FLP INT FL	11016	3					1	1	1
ENG 1 REVERSER	14015	3					1	1	1
ENG 1 EGT	14009	6	0-40MV				11	1	11
ENG 1 OIL QTY	14011	8	6.8V				11	1	11
ENG 1 OVERHEAT	14017	3					1	1	1
ENG 1 AFT NACELLE	14019	3					1	1	1
ENG 1 NOZZLE	14021	3					1	1	1
ENG 2 REVERSER	14016	3					1	1	1
ENG 2 EGT	14010	6	0-40MV				11	1	11
ENG 2 OIL QTY	14012	8	6.8V				11	1	11
ENG 2 OVERHEAT	14018	3					1	1	1
ENG 2 AFT NACELLE	14020	3					1	1	1
ENG 2 NOZZLE	14022	3					1	1	1
ENG 1 OIL PRES	14013	8	9.9-17.9V				11	2	22

9 1 0 TGAMST PROCESSOR 1 OUTPUT

SIGNAL NAME		SIG ID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	D/R	B/R
FF IV[illegible]		14023	6	0.4.97V				11	2	22
E[illegible] OIL PRES		14014	5	9.9-17.9V				11	2	22
[illegible]		14024	6	0.4.97V				11	2	22
TOTAL AIR TEMP.		16027	7					11	2	22
STATIC AIR TEMP.		16030	7					11	2	22
TOTAL AIR TEMP.		160[illegible]	7					11	2	22
STATIC AIR TEMP.		1[illegible]31	7					11	2	22
TOTAL AIR TEMP.		16029	7					11	2	22
STATIC AIR TEMP.		16032	7					11	2	22
FF [illegible]		14001	11	0-1.5VDC				10	4	40
FF [illegible]		14002	11	0-1.5VDC				10	4	40
FUEL [illegible]		12001	5	0-24.5 VDC				11	8	88
FUEL [illegible]		12002	6	0-24.5 VDC				11	8	88
FUEL [illegible]		12003	5	0-24.5 VDC				11	8	88
FUEL [illegible]		12004	6	0-24.5 VDC				11	8	88
FUEL [illegible]		12005	5	0-24.5 VDC				11	8	88
RPC STATUS	111	13002	3					1	8	8
RPC STATUS	114	13004	3					1	8	8
RPC STATUS	116	13006	3					1	8	8
RPC STATUS	115	13008	3					1	8	8
RPC STATUS	117	13010	3					1	8	8
RPC STATUS	123	13012	3					1	8	8
RPC STATUS	126	13014	3					1	8	8
RPC STATUS	1111	13016	3					1	8	8
RPC STATUS	1112	13018	3					1	8	8
RPC STATUS	1112	13020	3					1	8	8
RPC STATUS	1112	13022	3					1	8	8
RPC STATUS	1113	13024	3					1	8	8

9 1 0 ICAMST PROCESSOR 1

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	1113	13026	3					1	8	8
RPC STATUS	1113	13028	3					1	8	8
RPC STATUS	1122	13030	3					1	8	8
AV. RPC STATUS		13032	3					1	8	8
N1 RPC STATUS		13034	3					1	8	8
N2 RPC STATUS		13036	3					1	8	8
EGT RPC STATUS		13038	3					1	8	8
OIL RPC STATUS		13040	3					1	8	8
OIL RPC STATUS		13042	3					1	8	8
FF RPC STATUS		13044	3					1	8	8
AV. RPC STATUS		13046	3					1	8	8
N1 RPC STATUS		13048	3					1	8	8
N2 RPC STATUS		13050	3					1	8	8
EGT RPC STATUS		13052	3					1	8	8
OIL RPC STATUS		13054	3					1	8	8
OIL RPC STATUS		13056	3					1	8	8
FF RPC STATUS		13058	3					1	8	8
RPC STATUS	210	13060	3					1	8	8
RPC STATUS	210	13062	3					1	8	8
RPC STATUS	210	13064	3					1	8	8
RPC STATUS	210	13066	3					1	8	8
RPC STATUS	210	13068	3					1	8	8
RPC STATUS	230	13070	3					1	8	8
RPC STATUS	230	13074	3					1	8	8
RPC STATUS	230	13072	3					1	8	8
RPC STATUS	230	13076	3					1	8	8
RPC STATUS	240	13078	3					1	8	8
RPC STATUS	240	13030	3					1	8	8

8 I 0 IDAMST PROCESSOR 1 OUTPUT

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	240	13082	3					1	8	8
RPC STATUS	250	13084	3					1	8	8
RPC STATUS	250	13086	3					1	8	8
RPC STATUS	250	13088	3					1	8	8
RPC STATUS	260	13090	3					1	3	3
RPC STATUS	260	13092	3					1	8	8
RPC STATUS	311	13094	3					1	8	8
RPC STATUS	320	13096	3					1	8	8
RPC STATUS	330	13098	3					1	8	8
RPC STATUS	340	13100	3					1	9	8
RPC STATUS	360	13102	3					1	8	8
RPC STATUS	370	13104	3					1	8	8
RPC STATUS	[illegible]	13106	3					1	8	8
RPC STATUS	380	13108	3					1	8	8
RPC STATUS	391	13110	3					1	8	8
RPC STATUS	392	13112	3					1	8	8
RPC STATUS	411	13114	3					1	8	8
RPC STATUS	4111	13116	3					1	8	8
RPC STATUS	420	13118	3					1	8	8
RPC STATUS	420	13120	3					1	8	8
RPC STATUS	430	13122	3					1	8	8
RPC STATUS	430	13124	3					1	8	8
RPC STATUS	450	13126	3					1	8	8
RPC STATUS	460	13128	3					1	8	8
RPC STATUS	460	13130	3					1	8	8
RPC STATUS	460	13132	3					1	8	8
RPC STATUS	470	13134	3					1	8	8
RPC STATUS	460	13136	3					1	8	8

8 1 0 IDAMST PROCESSOR 1 OUTPUT

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	480	13138	3					1	8	8
RPC STATUS	480	13140	3					1	8	8
RPC STATUS	511	13142	3					1	8	8
RPC STATUS	512	13144	3					1	8	8
RPC STATUS	513	13146	3					1	8	8
RPC STATUS	514	13148	3					1	8	8
RPC STATUS	520	13150	3					1	8	8
RPC STATUS	531	13152	3					1	8	8
RPC STATUS	SCP	13154	3					1	8	8
RPC STATUS	IMK	13156	3					1	8	8
RPC STATUS	IMK	13158	3					1	8	8
RPC STATUS	IMK	13160	3					1	8	8
RPC STATUS	IMK	13162	3					1	8	8
RPC STATUS	DSMU	13164	3					1	8	8
RPC STATUS	OEK	13166	3					1	8	8
RPC STATUS	OEK	13168	3					1	8	8
RPC STATUS	MMK	13170	3					1	8	8
RPC STATUS	SYM	13172	3					1	8	8
RPC STATUS	MPDG1	13174	3					1	8	8
RPC STATUS	MPDG2	13176	3					1	8	8
RPC STATUS	SCAN	13178	3					1	8	8
RPC STATUS	MPD1	13180	3					1	8	8
RPC STATUS	MPD2	13162	3					1	8	8
RPC STATUS	MPD3	13184	3					1	8	8
RPC STATUS	HUD1	13186	3					1	8	8
RPC STATUS	HUD2	13188	3					1	8	8
RPC STATUS	HSD1	13190	3					1	8	8
RPC STATUS	HSD2	13192	3					1	8	8

8 1 0 IDAMST PROCESSOR 1 OUTPUT

SIGNAL NAME		SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
RPC STATUS	MFDC	13194	3					1	8	8
RPC STATUS	HSD	13196	3					1	8	8
RPC STATUS	MNL	13198	3					1	8	8
RPC STATUS	IMK	13200	3					1	8	8
RPC STATUS	IMK	13202	3					1	8	8
RPC STATUS	IMK	13204	3					1	8	8
RPC STATUS	IMK	13206	3					1	8	8
RPC STATUS	DEMK	13208	3					1	8	8
RPC STATUS	DEK	13210	3					1	8	8
RPC STATUS	DEK	13212	3					1	8	8
RPC STATUS	MMK	13214	3					1	8	8
RPC STATUS	SYM	13216	3					1	8	8
RPC STATUS	MPDG1	13218	3					1	8	8
RPC STATUS	MPDG2	13220	3					1	8	8
RPC STATUS	SCAN	13222	3					1	8	8
RPC STATUS	MPD1	13224	3					1	8	8
RPC STATUS	MPD2	13226	3					1	8	8
RPC STATUS	MPD3	13228	3					1	8	8
RPC STATUS	HUD1	13230	3					1	8	8
RPC STATUS	HUD2	13232	3					1	8	8
RPC STATUS	HSD1	13234	3					1	8	8
RPC STATUS	HSD2	13236	3					1	8	8
RPC STATUS	MFDC	13238	3					1	8	8
ENG 1 M1		14005	11	0-5V				7	8	56
ENG 1 M2		14007	11	±3V				7	8	56
ENG 2 M1		14006	11	0-5V				7	8	56
ENG 2 M2		14008	11	±3V				7	8	56
DITS RECORDER(OUT)		80172	10					32	8	256

8 1 0 IDAMST PROCESSOR 1

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR (OUTPUT)	RESOLUTION	QUAN	U/R	B/R
ELEV POS L	11017	18					14	16	224
ELEV POS R	11018	18					14	16	224
RUDDER POS	11019	18					14	16	224
OUTBOARD FLP POS(L)	11003	18					14	16	224
MID FLP POS (L)	11004	18					14	16	224
USB LEFT	11005	18					14	16	224
SPOILER 1L POS	11020	18					14	16	224
SPOILER 2L POS	11021	18					14	16	224
OUTBOARD FLP POS(R)	11006	18					14	16	224
MID FLAP POS(R)	11007	18					14	16	224
USB RIGHT	11008	18					14	16	224
SPOILER 1R POS	11022	18					14	16	224
SPOILER 2R POS	11023	18					14	16	224
TRUE AIR SPEED	16024	9					14	32	448
TRUE AIR SPEED	16025	9					14	32	448
TRUE AIR SPEED	16026	9					14	32	448
MISSION RCDR(OUT)	80170	10					512	64	32768

8 2 0 IOAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LAMP TEST GROUND	43013	3					1	1	1
LAMP TEST GROUND	43014	3					1	1	1
FREQ A POSN	43027	3			GND=1/OPEN=0		1	1	1
FREQ B POSN	43028	3			GND=1/OPEN=0		1	1	1
RELAY RETURN	43029	3			GND=1/OPEN=0		1	1	1
16K FT/RANGE MARK	43044	3	OPEN & GND				1	1	1
8K FT/RANGE MARK	43045	3	OPEN & GND				1	1	1
4K FT/RANGE MARK	43046	3	OPEN & GND				1	1	1
2K FT/RANGE MARK	43047	3	OPEN & GND				1	1	1
1K FT/RANGE MARK	43048	3	OPEN & GND				1	1	1
FREQUENCY A	43019	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
FREQUENCY B	43020	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
STBY SWTH POSITION	43021	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
MASTER SIGNAL	43022	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
FOLLOWER SIGNAL	43023	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
BITE TEST	43024	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
BITE TEST COMPL	43025	4	0 TO 5 VDC		0VDC=0/5VDC=1		1	1	1
LEGEND DIM	43031	5	0 TO 5 VDC				11	1	11
RANGE MARK BRT CONT	43042	5	0 TO 5 VDC				11	1	11
10MHZ FREQ SEL 2**4	34001	1	0/1				1	2	2
10MHZ FREQ SEL 2**3	34002	1	0/1				1	2	2
10MHZ FREQ SEL 2**2	34003	1	0/1				1	2	2
10MHZ FREQ SEL 1**1	34004	1	0/1				1	2	2
1MHZ FREQ SEL 2**5	34005	1	0/1				1	2	2
1MHZ FREQ SEL 2**4	34006	1	0/1				1	2	2
1MHZ FREQ SEL 2**3	34007	1	0/1				1	2	2
1MHZ FREQ SEL 2**2	34008	1	0/1				1	2	2
1MHZ FREQ SEL 2**1	34009	1	0/1				1	2	2

8 2 0 IDAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
0.1MHZ FRQ SEL 2**5	34010	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**4	34011	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**3	34012	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**2	34013	1	0/1				1	2	2
0.1MHZ FRQ SEL 2**1	34014	1	0/1				1	2	2
0.01MHZ FQ SEL 2**5	34015	1	0/1				1	2	2
0.01MHZ FQ SEL 2**4	34016	1	0/1				1	2	2
0.01MHZ FQ SEL 2**3	34017	1	0/1				1	2	2
0.01MHZ FQ SEL 2**2	34018	1	0/1				1	2	2
0.01MHZ FQ SEL 2**1	34019	1	0/1				1	2	2
0.005MHZ FQSEL 2**2	34020	1	0/1				1	2	2
0.005MHZ FQSEL 2**1	34021	1	0/1				1	2	2
RECHANNEL PULSE	32031	2	+10 VDC/GND				1	2	2
BIT OUTPUT	32037	2	+10 VDC/0 VDC		+10VDC=1/0VDC=0		1	2	2
NORTH STABILITY	21054	3					1	2	2
FULL HIGH(BAND) CMD	21066	3	0 VDC				1	2	2
SCAN MODE (LEFT)	21067	3	28 VDC				1	2	2
SCAN MODE (RIGHT)	21068	3	28 VDC				1	2	2
ANT CPLR BAND 1	32001	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 2	32002	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 3	32003	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 4	32004	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 5	32005	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 6	32006	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 7	32007	3	GND/OPEN		GND=1/OPEN=0		1	2	2
ANT CPLR BAND 8	32008	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 1	32009	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 2	32010	3	GND/OPEN		GND=1/OPEN=0		1	2	2

A 2 0 IDAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	R/R
AMP/PS BAND 3	32011	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 4	32012	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 5	32013	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 6	32014	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 7	32015	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 8	32016	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 9	32017	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AMP/PS BAND 10	32018	3	GND/OPEN		GND=1/OPEN=0		1	2	2
SSB	32019	3	GND/OPEN		GND=1/OPEN=0		1	2	2
AME	32020	3	GND/OPEN		GND=1/OPEN=0		1	2	2
FSK	32021	3	GND/OPEN		GND=1/OPEN=0		1	2	2
CW	32039	3	GND/OPEN		GND=1/OPEN=0		1	2	2
GUARDBAND A BANDSW	32040	3	GND/OPEN				1	2	2
GUARDBAND B BANDSW	32041	3	GND/OPEN				1	2	2
FREQ SEL COMM	34022	3	GND/OPEN				1	2	2
ST DISABLE COMM TST	34023	3	GND/OPEN				1	2	2
SQUELCH DISABLE	39017	3					1	2	2
W/A	39018	3					1	2	2
POWER ON/OFF	39019	3					1	2	2
SQUELCH DISABLE	39064	3					1	2	2
W/A	39065	3					1	2	2
POWER ON/OFF	39066	3					1	2	2
1MHZ FREQ SEL B	41008	3	GND/OPEN		GND=1/OPEN=0		1	2	2
1MHZ FREQ SEL E	41009	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL A	41010	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL B	41011	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL E	41012	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.01MHZ FREQ SEL C	41013	3	GND/OPEN		GND=1/OPEN=0		1	2	2

8 2 0 IDAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
1MHZ FREQ SEL B	41092	3	GND/OPEN		GND=1/OPEN=0		1	2	2
1MHZ FREQ SEL E	41093	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL A	41044	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL D	41045	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.1MHZ FREQ SEL E	41046	3	GND/OPEN		GND=1/OPEN=0		1	2	2
0.01MHZ FREQ SEL C	41047	3	GND/OPEN		GND=1/OPEN=0		1	2	2
PENCIL GND	21020	4	0 TO 26 VDC				1	2	2
PANEL LIGHTS	32022	4	OPEN/-5 VDC		-5VDC=1/OPEN=0		1	2	2
RE DIS ON/OFF	34024	4	0/27.5 VDC				1	2	2
RIGHTTURN SWITCH	43087	4	5 VDC		GND=1/5VDC=0		1	2	2
SPEED UP SWITCH	43089	4	5 VDC		GND=1/5VDC=0		1	2	2
PULL UP SWITCH	43091	4	5 VDC		GND=1/5VDC=0		1	2	2
EXECUTE SWITCH	43093	4	5 VDC		GND=1/5VDC=0		1	2	2
LETDOWN SWITCH	43095	4	5 VDC		GND=1/5VDC=0		1	2	2
SLOWDOWN SWITCH	43097	4	5 VDC		GND=1/5VDC=0		1	2	2
LEFTTURN SWITCH	43099	4	5 VDC		GND=1/5VDC=0		1	2	2
FUNCTION SEL ADF	47007	4	0 VDC/+10 VDC				1	2	2
CW/VOICE (BFO ON)	47025	4					1	2	2
NOISE BLKR CONTROL	32028	5	+10 VDC/-5 VDC				11	2	22
RF GAIN CONTROL	32029	5	+10 VDC/-5 VDC				11	2	22
SQUELCH CONTROL	32030	5	+10 VDC/-5 VDC				11	2	22
VHF-VCO TNG VOLTGE	32033	5	+11 VDC/+35 VDC				11	2	22
PARAMP TNG VOLTGE	32034	5	+11 VDC/+35 VDC				11	2	22
VOLUME CONTROL	32035	6	-5 VDC/0 VDC				11	2	22
I. 150-LOAD	21127	1	26 VDC				1	4	4
DIST FLAG(+)	46071	1					1	4	4
WG SWITCH GND	21075	3	0 VDC				1	4	4
GP. SIG	21076	3	0 VDC				1	4	4

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
2KHZ PRF SEL GND	21077	3	0 VDC				1	4	4
1KHZ PRF SEL GND	21078	3	0 VDC				1	4	4
250HZ PRF SEL GND	21079	3	0 VDC				1	4	4
WEATHER STD GND	21080	3	0 VDC				1	4	4
AGILE GND	21081	3	0 VDC				1	4	4
STBY GND	21082	3	0 VDC				1	4	4
FTC GND	21088	3	0 VDC				1	4	4
GND IN BEACON	21115	3					1	4	4
SCAN R	21089	3	0 VDC				1	4	4
SCAN A	21091	3	0 VDC				1	4	4
RANGE SEL 3-30/1	21101	3					1	4	4
RANGE SEL 3-30/5	21102	3					1	4	4
RANGE SEL 50/10	21103	3					1	4	4
RANGE SEL 100/20	21104	3					1	4	4
RANGE SEL 240/30	21105	3					1	4	4
BEACON MODE	21108	3					1	4	4
WEATHER MODE	21109	3					1	4	4
SLAVE/REL	21169	3					1	4	4
CONTROL POS 5(UHF R	36006	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS3(VHF/AM)	36007	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS7	36008	3	OPEN 28 V CLO GND				1	4	4
CNTRL POS4(HF/SSB)	36009	3	OPEN 28 V CLO GND				1	4	4
CONTL POS1 (SPARE)	36030	3	OPEN 28V CLO GND				1	4	4
CONTROL POS 5(UHF R	36059	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 3 (VHF/AM	36060	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 7	36061	3	OPEN 28V CLO GND				1	4	4
CNTRL POS 4 (HF/SSB	36062	3	OPEN 28V CLO GND				1	4	4
CONTL POS2(VHF/FM)	36075	3	OPEN 28V CLO GND				1	4	4

6.2.9 [illegible] PROCESSOR 2

[illegible]	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
[illegible]	36094	3	OPEN 28V CLO GRD				1	4	4
TO[illegible] KEY	39013	3					1	4	4
A[illegible]	39014	3					1	4	4
[illegible]	39022	3					1	4	4
KY/[illegible] INTLK [illegible]	39024	3					1	4	4
KY/[illegible] TLK IN	39025	3					1	4	4
PRESET FREQ READ	39026	3					1	4	4
TONE KEY	39060	3					1	4	4
ADF ENABLE	39061	3					1	4	4
GUARD ON/OFF	39069	3					1	4	4
KY/[illegible] INTLK OUT	39071	3					1	4	4
KY/[illegible] INTLK I[illegible]	39072	3					1	4	4
P[illegible] FREQ READ	39073	3					1	4	4
S[illegible]	21[illegible]	3	0 VDC				1	4	4
[illegible] SEL [illegible]	21096	3					1	4	4
R[illegible] SEL [illegible]	21097	3					1	4	4
RA[illegible] SEL [illegible]	21[illegible]	3					1	4	4
RA[illegible] SEL [illegible]	2109[illegible]	3					1	4	4
RA[illegible] SEL 240/30	21100	3					1	4	4
BEACON MODE	21106	3					1	4	4
WEATHER MODE	21107	3					1	4	4
INTERLOCK	21135	3					1	4	4
ICOTL1 CALL CNTRL	36005	4	28 V				1	4	4
ICOTL2 CALL CNTRL	36056	4	28 V				1	4	4
KY/A[illegible] INTLOCK	39016	4					1	4	4
KY/ADF INTLOCK	39063	4					1	4	4
FREQ SEL	21084	5	+3.9 TO -3.9 VDC				11	4	44
DIST X UNITS	46065	5					11	4	44

8 2 0 IDAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	D/R
DIST X TENS	46066	5					11	4	44
DIST X HUNDS	46067	5					11	4	44
DIST Y UNITS	46068	5					11	4	44
DIST Y TENS	46069	5					11	4	44
DIST Y HUNDS	46070	5					11	4	44
AZ STAT (RTN)	21095	7					11	4	44
GEN 1 (IN)	80025	1					1	8	8
GEN 2 (IN)	80029	1					1	8	8
MFDC1- 1 (IN)	80088	1					1	8	8
MFDC1- 2 (IN)	80089	1					1	8	8
MFDC1- 3 (IN)	80090	1					1	8	8
MFDC1- 4 (IN)	80091	1					1	8	8
MFDC1- 5 (IN)	80092	1					1	8	8
MFDC1- 6 (IN)	80093	1					1	8	8
MFDC1- 7 (IN)	80094	1					1	8	8
MFDC1- 8 (IN)	80095	1					1	8	8
MFDC1- 9 (IN)	80096	1					1	8	8
MFDC1-10 (IN)	80097	1					1	8	8
MFDC1-11 (IN)	80098	1					1	8	8
MFDC1-12 (IN)	80099	1					1	8	8
MFDC1-13 (IN)	80100	1					1	8	8
MFDC1-14 (IN)	80101	1					1	8	8
MFDC1-15 (IN)	80102	1					1	8	8
MFDC1-16 (IN)	80103	1					1	8	8
MFDC1-17 (IN)	80104	1					1	8	8
MFDC1-18 (IN)	80105	1					1	8	8
MFDC1-19 (IN)	80106	1					1	8	8
MFDC1-20 (IN)	80107	1					1	8	8

8 2 0 IOAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFCC1-21 (IN)	80108	1					1	8	8
MFCC1-22 (IN)	80109	1					1	8	8
MFCC1-23 (IN)	80110	1					1	8	8
MFCC1-24 (IN)	80111	1					1	8	8
MFCC1-25 (IN)	80112	1					1	8	8
STICK SHAKER 1	2001	3					1	8	8
STICK SHAKER 2	2002	3					1	8	8
150-ECHO LEVEL	21150	3					1	8	8
TONE SQUELCH GROUND	33001	3	OPEN OR GROUND	NA	OPEN=NO SQUELCH GND=SQUELCH	NA	1	8	8
SQUELCH DISABLE GND	33002	3	OPEN OR GROUND	NA	OPEN=NO DISABLE GND=DISABLE	NA	1	8	8
0.05 MC SELECT E	33005	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT D	33006	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT C	33007	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT B	33008	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
0.05 MC SELECT A	33009	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
BAND A 30-52 MC	33010	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
BAND B 53-76 MC	33011	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT E	33012	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT C	33013	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT D	33014	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT B	33015	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
MC SELECT A	33016	3	OPEN OR GROUND	NA	OPEN=NO SELECT GND=SELECT	NA	1	8	8
NAR/B CONT	33031	3	OPEN OR GROUND	NA	OPEN=NARROW GND=WIDE	NA	1	8	8
VHF PRESS-TO-TALK	33033	3	OPEN OR GROUND	NA	NA	NA	1	8	8
XMT KEY	39021	3					1	8	8
ALT KEY	39068	3					1	8	8
ANTENNA SWITCHING	48017	3	OPEN OR GND	NA	OPEN=NO SWITCH GND=SWITCH	NA	1	8	8
ADF ENABLE	48021	3	OPEN OR GND	NA	OPEN=NO ENABLE GND=ENABLE	NA	1	8	8

B 2 0 TOAMST PROCESSOR 2 INPUT

SIGNAL NAME	TIC??	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ADF TIME CONSTANT	43008	3	OPEN OR GND	NA	OPEN=NO TC GND=TC	NA	1	8	8
POWER ?	46009	3	OPEN OR GND	NA	OPEN=NO POWER GND=POWER	NA	1	8	8
CHANNEL GUARD ON	45010	3	OPEN OR GND	NA	OPEN=NOT ON GND=ON	NA	1	8	8
[illegible] ON	26005	4					1	8	8
CHANNEL SELECT LOGI	4 012	4	OPEN OR 28 VDC	NA	OPEN=NOT SELECT 28VDC=SELECTED	NA	1	8	8
CHANNEL SELECT LOGI	46013	4	OPEN OR 28VDC	NA	OPEN=NOT SELECT 28VDC=SELECTED	NA	1	8	8
28VDC I. TF	28149	4	OPEN OR 28 VDC	NA	OPEN=NOT TF MODE 28VDC=TF MODE	NA	1	8	8
[illegible] MARK ITEG	21146	5	+4.3 VDC TO 0				11	8	88
SWEEP INTENSITY	21147	5	+3.0 VDC TO 0				11	8	88
15C-ECHO	21149	5					11	8	88
VIDEO GAIN	21151	5	-15 VDC TO 0				11	8	88
RANGE MARK INTENS	21152	5	+4.3 VDC TO 0				11	8	88
TO/FROM(+FROM)	46073	5					11	8	88
DEVIATION (+LEFT)	46074	5					11	8	88
TO/FROM(+TO)	46075	5					11	8	88
DEVIATION(+RIGHT)	46076	5					11	8	88
NAV FLAG L	46077	5					11	8	88
NAV FLAG H	46078	5					11	8	88
CRS-?	46079	5					11	8	88
CRS-F	46080	5					11	8	88
CRS-B	46081	5					11	8	88
CRS-A	46082	5					11	8	88
MAIN SQUELCH ADJ HI	39003	6					11	8	88
MAIN SQUELCH ADJ CT	39004	6					11	8	88
GUARD SQ ADJ HI	39005	6					11	8	88
GUARD SQ ADJ CT	39006	6					11	8	88
MAIN SQUELCH ADJ HI	39050	6					11	8	88
MAIN SQUELCH ADJ CT	39051	6					11	8	88

8 2 C IOAMST PROCESSOR 2 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
GUARD SQ ADJ HI	39052	6					11	8	88
GUARD SQ ADJ CT	39053	6					11	8	88
PILOT HSI (F)	24028	9					14	8	112
PILOT BDHI 6	24119	9					14	8	112
COMPASS X	46086	9	26 VAC 400HZ				14	8	112
BRG RMI X	46089	9	26 VAC 400HZ				14	8	112
SCAN (IN)	80165	10					512	8	4096
DSNC (IN)	80009	10					16	8	128
MMK (IN)	80033	10					16	8	128
IMK 1 (IN)	80017	10					32	8	256
IMK 2 (IN)	80021	10					32	8	256
IMK SYMBOL (IN)	80013	10					96	8	768
SCAL A	21092	3	0 VDC				1	16	16
STC RANGE	21085	5					11	16	176
STC DEPTH	21086	5					11	16	176
RCVR GAIN	21087	5					11	16	176
ISO-ECHO LEVEL	21126	5					11	16	176
AZ STAB (SIN)	21093	7					11	16	176
AZ STAB (COS)	21094	7					11	16	176
ALTITUDE	21133	7					11	16	176
GND RANGE	21134	7					11	16	176
TILT CONTROL(X,Y,Z)	21015	9					14	16	224
TRUE AIRSPEED	26001	9					14	16	224
TENARY CONTROL A	46007	10	+-5 VDC				32	16	512
TENARY CONTROL B	46008	10	+-5 VDC				32	16	512
PHOTO PCKP OUTPT	43036	11					7	16	112
RANGE MARK	43037	11					7	16	112
AZ CURSOR (SIN,COS)	21122	18					14	16	224

6 2 0 IDAMST PROCESSOR 2

INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HUD OFF FAILED RTN	26171	1	0 OR 5 VDC	NA	OPEN=HUD ON/OK 5VDC=HUD OF/FAIL	NA	1	32	32
TRACK STAB	21063	3	5 VDC				1	32	32
STEERING COMP OPT	43055	3					1	32	32
X DEFLECTION	43033	6					11	32	352
Y DEFLECTION	43034	6					11	32	352
SECTOR WIDTH SIN	21045	6	-1.2V TO +1.2 VAC				11	32	352
SECTOR WIDTH COS	21046	6	0 TO 2.2 VAC				11	32	352
STEERING CMDS 1	16003	10					80	32	2560
STEERING CMDS 2	16006	10					80	32	2560
STEERING CMDS 3	16009	10					80	32	2560
DATA WORD	28222	10	0 OR 5 VDC	NA	NA	NA	128	32	4096
DATA WORD IP	28223	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA WORD II	28224	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA READY	28225	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA READY	28226	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA CLOCK	28227	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA CLOCK	28228	10	0 OR 5 VDC	NA	NA	NA	16	32	512
AZIMUTHS (SIN,COS)	21044	18	0 TO 18 VDC				14	32	448
[illegible] 1 (IN)	30001	10					512	64	32768
[illegible] 2 (IN)	[illegible]03	10					512	64	32768

8 2 0 IDAMST PROCESSOR 2 OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
LAMP TEST GROUND	43015	3					1	1	1
LAMP TEST GROUND	43016	3					1	1	1
LAMP TEST GROUND	43017	3					1	1	1
REC LEFT TURN LP G	43075	3	+5 VDC		GND=1/OPEN=0		1	1	1
REC SLOWDOWN LP GND	43076	3	+5 VDC				1	1	1
REC LETDOWN LP GND	43077	3	+5 VDC				1	1	1
REC EXECUTE LP GND	43078	3	+5 VDC				1	1	1
REC PULLUP LP GND	43079	3	+5 VDC				1	1	1
REC SPEED UP LP GND	43080	3	+5 VDC		GND=1/OPEN=0		1	1	1
REC RIGHT TURN LP G	43081	3	+5 VDC		GND=1/OPEN=0		1	1	1
LEGEND DIM HI	43012	4	5 VDC				1	1	1
MASTER LAMP GND	43070	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
MASTER LOSTLAMP GND	43071	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
CAUTION LAMP GND	43072	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
PROXIMITY AMRG LP G	43073	4	0 OR 5 VDC		0VDC=0/5VDC=1		1	1	1
LEGEND DIM	43011	5	0 TO 5 VDC				11	1	11
LEGEND DIM	43053	5	0 TO 28 VDC				11	1	11
LEGEND DIM	43054	5	0 TO 28 VDC				11	1	11
RT STATUS FLAG	46009	1	0 TO +18-32V				1	1	1
DISTANCE FLAG	46056	1					1	1	1
PWR INTERLOCK OUT	46011	3					1	1	1
SEC DC POWER	27009	4	OPEN OR 28VDC	NA	OPEN=WT OFF GEAR	NA	1	2	2
ENGINE 1 LOOP A	8001	4					1	2	2
ENGINE 1 LOOP B	8003	4					1	2	2
ENGINE 2 LOOP A	8005	4					1	2	2
ENGINE 2 LOOP B	8007	4					1	2	2
STABILIZER TRIM	11002	3					1	2	2
MASTER CAUTION (P)	15001	3					1	2	2

8 2 0 ICAMST PROCESSOR 2

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
HLC (P)	15003	3					1	2	2
ANTI-ICE (P)	15004	3					1	2	2
FUEL (P)	15005	3					1	2	2
OVERHEAD ANN(P)	15006	3					1	2	2
ELECTRICAL (P)	15007	3					1	2	2
HYDRAULIC (P)	15008	3					1	2	2
CENTER AISLE (P)	15009	3					1	2	2
EFLS (P)	15010	3					1	2	2
CAUTION RECALL(P)	15011	3					1	2	2
HEADS UP DISPL IN 1	25015	10					208	2	416
OMEGA DISPLAY(P)	26003	10					192	2	384
HT 510	32026	2	-5 VDC/+10 VDC		-5VDC=R/+10VDC=X		1	2	2
RT 105	32027	2	+10 VDC/-5 VDC		-5VDC=R/+10VDC=X		1	2	2
PUSH-TO-TALK	34025	3	GND/OPEN				1	2	2
TWO INSLOT LCG	43001	3	0 TO 5 VDC				1	2	2
TWO MASTER LCG	43002	3	0 TO 5 VDC				1	2	2
NO GO LCG	43003	3	0 TO 5 VDC				1	2	2
MASTER LAMP LCG	43004	3	0 TO 5 VDC				1	2	2
MASTER LAMP LCG	43005	3	0 TO 5 VDC				1	2	2
XMIT ATTURN LP CTL	43086	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT SPEEDUP LP CTL	43088	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT PULLUP LP CTL	43090	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT EXECUTE LP CTL	43092	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT LETDOWN LP CTL	43094	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT SLOWDN LP CTL	43096	3	5 VDC		GND=1/OPEN=0		1	2	2
XMIT LFTURN LP CTL	43098	3	5 VDC		GND=1/OPEN=0		1	2	2
RF CONTROL ARM	47002	5					11	2	22
EDGE LIGHT	21137	4	26 VDC				1	2	2

8 2 0 IDAMST PROCESSOR 2 OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
50/10 LAMP RTN	21163	3					1	4	4
100/20 LAMP RTN	21164	3					1	4	4
3-30/5 LAMP RTN	21165	3					1	4	4
3-30/1 LAMP RTN	21166	3					1	4	4
240/30 LAMP RTN	21167	3					1	4	4
R0/5 LAMP RTN	21169	3					1	4	4
MAG HEADING BAD	25029	1	+28 VDC		28VDC=TRUE		1	4	4
RANGE TO DEST UNITS	25023	9		0/9		1/2 MILE MR	14	4	56
RANGE TO DEST TENS	25024	9		0/90			14	4	56
RANGE TO DEST HUNDS	25025	9		0/900			14	4	56
DEST REL BEARING	25026	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
MAG HEADING	25027	9		0/360 DEG	1DEG=1DEG	5 DEG	14	4	56
ADC FAIL	27110	1	0 OR 5 VDC	NA	0VDC=ADC OK 5VDC=ADC FAIL	NA	1	8	8
DATA AD (TRUE&COMP)	27092	10	0 OR 5 VDC	NA		NA	160	32	5120
SERVO FAILED	21074	5					11	8	88
ATTITUDE GOOD	25022	1	A/C+28 VDC		28VDC=TRUE		1	8	8
UHF RADIO CNTRL	36043	3	OPEN 28V CLO GND				1	8	8
400 HZ MARKER BEACN	41075	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41076	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41077	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41081	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41082	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41083	3	GND/OPEN		GND=1/OPEN=0		1	8	8
BRG DATA 4	42036	9					14	8	112
BRG DATA 5	42037	9					14	8	112
RAMP RATE ANA CONT	43043	5	0 TO 22 VDC				11	8	88
SERIAL DATA OUT	46053	10	+-12 VDC				120	8	1024
SYNCHRO H	47036	9					14	8	112

5 2 0 ICAMST PROCESSOR 2

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SYNCHRO X	47037	9					14	8	112
SYNCHRO Y	47038	9					14	8	112
SYNCHRO Z	47039	9					14	8	112
SYNCHRO [illegible]	47040	9					14	8	112
SENSITIVITY CONTROL	[illegible]	3	OPEN OR GND	NA	OPEN=CONTROL GND=NO CONTROL	NA	1	8	8
QUAD IDENT	51010	1	+5 VDC		5VDC=1/GND=0		1	8	8
QUAD IDENT	51011	1	+5 VDC		5VDC=1/GND=0		1	8	8
[illegible] THREAT ID	51012	1	+5 VDC		5VDC=1/GND=0		1	8	8
TARGET ACQUISITION	51003	4	+5 VDC		5VDC=1/GND=0		1	8	8
SELF TEST	23015	3	GROUND	NA	OPEN=NO SELF TST GND=SELF TST INT	NA	1	8	8
SELF TEST	23053	3	GROUND	NA	OPEN=NO SELF TST	NA	1	8	8
[illegible] (OUT)	80156	10					16	8	128
[illegible] (OUT)	80010	10					16	8	128
[illegible] (OUT)	80034	10					32	8	256
IM 1 (OUT)	80018	10					32	8	256
IM 2 (OUT)	80022	10					32	8	256
[illegible] 2 (OUT)	80032	10					96	8	768
GEN 1 (OUT)	80026	10					96	8	768
IM SYMBOL (OUT)	80014	10					16	8	128
MFDCI- 1 (OUT)	80063	3					1	8	8
MFDCI- 2 (OUT)	80064	3					1	8	8
MFDCI- 3 (OUT)	80065	3					1	8	8
MFDCI- 4 (OUT)	80066	3					1	8	8
MFDCI- 5 (OUT)	80067	3					1	8	8
MFDCI- 6 (OUT)	80068	3					1	8	8
MFDCI- 7 (OUT)	80069	3					1	8	8
MFDCI- 8 (OUT)	80070	3					1	8	8
MFDCI- 9 (OUT)	80071	3					1	8	8

6 2 0 IDAYST PROCESSOR 2 OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFDC1-10 (OUT)	80072	3					1	8	8
MFDC1-11 (OUT)	80073	3					1	8	8
MFDC1-12 (OUT)	80074	3					1	8	8
MFDC1-13 (OUT)	80075	3					1	8	8
MFDC1-14 (OUT)	80076	3					1	8	8
MFDC1-15 (OUT)	80077	3					1	8	8
MFDC1-16 (OUT)	80078	3					1	8	8
MFDC1-17 (OUT)	80079	3					1	5	8
MFDC1-18 (OUT)	80080	3					1	8	8
MFDC1-19 (OUT)	80081	3					1	8	8
MFDC1-20 (OUT)	80082	3					1	8	8
MFDC1-21 (OUT)	80083	3					1	8	8
MFDC1-22 (OUT)	80084	3					1	8	8
MFDC1-23 (OUT)	80085	3					1	8	8
MFDC1-24 (OUT)	80086	3					1	8	8
MFDC1-25 (OUT)	80087	3					1	8	8
CCA 1	80041	3					1	8	8
TUNING METER	47001	5					11	16	176
45 DEFLECTION	53066	5	0 TO 25 VDC	NA	NA	5	11	16	176
225 DEFLECTION	53087	5	0 TO 25 VDC	NA	NA	5	11	16	176
315 DEFLECTION	53088	5	0 TO 25 VDC	NA	NA	5	11	16	176
135 DEFLECTION	53089	5	0 TO 25 VDC	NA	NA	5	11	16	176
TRUE AIRSPEED	27111	5		NA		1 KNOT	11	32	352
BAROMETRIC ALT	27112	5	0 TO 4 VDC	118 KTS TO 600KT	12.75 FAIL/MV	25 FEET	11	32	352
MACH OUTPUT	27113	5	0 TO 4 VDC	1000 TO 50000 FT	0.19M/VOLT	+-.002M/10.5MV	11	32	352
AIR SPEED	28082	5	0 TO +2.2 VDC	0 TO -2.2 DEG	1VDC/1DEG	0.5 %	11	32	352
GROUND	28083	5	0 TO +15 VDC	0 TO 699 KTS	150MV/7KTS	0.5 %	11	32	352
DATA WD (TRUE&COMP)	27093	10	0 OR 5 VDC	NA		NA	160	32	5120

A 2 0 IDAMST PROCESSOR 2

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR (OUTPUT)	RESOLUTION	QUAN	U/R	B/R
DATA WD 10 TRUESCOM	27094	10	0 OR 5 VDC	NA		NA	16	32	512
DATA WD 11 TRUESCOM	27095	10	0 OR 5 VDC	NA		NA	16	32	512
DATA RDY TRUESCOMP	27096	10	0 OR 5 VDC	NA		NA	16	32	512
DATA RDY TRUESCOMP	27097	10	0 OR 5 VDC	NA		NA	16	32	512
TF RELIABILITY	23057	1	OPEN OR +0.380 VDC	NA	OPEN=TF OK .380VDC=TF NO OK	NA	1	32	32
SET RANGE	28037	4	OPEN OR 28VDC	NA	OPEN=NO RANGE 28VDC=RANGE	NA	1	32	32
SET RANGE TEST	28038	4	OPEN OR 28VDC	NA	OPEN=NO TEST 28VDC=TEST	NA	1	32	32
[illegible]IFIED RELIABILIT	23029	1	0 OR 5 VDC		OVDC=OK 5VDC=FAIL	NA	1	32	32
LINEARIZED ALTITUDE	23031	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	7 FEET	11	32	352
LINEARIZED ALTITUDE	23032	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	7 FEET	11	32	352
RADAR ALTITUDE	28027	5	0 TO +25 VDC	0 TO 5,000 FT	35MV/7FEET	7 FEET	11	32	352
[illegible]IFIED RELIABILIT	23066	1	0 TO 5 VDC		OVDC=OK	NA	1	32	32
LINEARIZED ALTITUDE	23069	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	FEET	11	32	352
LINEARIZED ALTITUDE	23070	5	0 TO 25 VDC	0-5000 FT	35MV/7FT	FEET	11	32	352
STEERING ERROR	25030	5		+-10 DEG	150 UA/10 DEG	1/16 DISP	11	32	352
ROLL	25018	9		0/360 DEG	1DEG=1DEG	0.1 DEG RMS	14	32	448
LOC INST DEVIATION	41025	6					11	32	352
LOC FLAG OUTPUT	41026	6					11	32	352
GS INSTR DEVIATION	41027	6					11	32	352
GS FLAG OUTPUT	41028	6					11	32	352
LOC DEVIATION	41029	6					11	32	352
GS DEVIATION	41030	6					11	32	352
LOC FLAG OUTPUT	41031	6					11	32	352
GS FLAG OUTPUT	41032	6					11	32	352
LOC DEVIATION	41033	6					11	32	352
GS DEVIATION	41034	6					11	32	352
LOC INST DEVIATION	41059	6					11	32	352
LOC FLAG OUTPUT	41060	6					11	32	352

8 2 0 IDAMST PROCESSOR 2

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
GS INSTR DEVIATION	41061	6					11	32	352
GS FLAG OUTPUT	41062	6					11	32	352
LOC DEVIATION	41067	6					11	32	352
GS DEVIATION	41068	6					11	32	352
COUPLET SIGNAL	43032	6					11	32	352
ANTENNA BEARING	49042	9	11.8 VAC	0 TO 360 DEG	1DEG/DEG	12 ARC MIN	14	32	448
AZIMUTH POS (X,Y,Z)	21043	9	0 TO 11.8 VAC				14	64	896
PITCH	25021	9		+-90 DEG	1DEG=1DEG	0.1 DEG RMS	14	64	896
MPRG 1 (OUT)	80002	10					16	64	1024
MPRG 2 (OUT)	80004	10					16	64	1024

8 3 C IDAMST PROCESSOR 3 INPUT

SIGNAL NAME	DIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	G/R
AUTIC OFF	43159	3	0 VDC		GND=1/OPEN=1		1	2	2
A [illegible] RESET	43140	3	0 VDC		GND=1/OPEN=1		1	2	2
115V 400HZ	53002	3	115 VAC	NA	115 VAC OR OPEN	NA	1	2	2
[illegible]TLE	53072	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
ID PUSHBUTTON	43105	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TTOA)	43106	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT04)	43107	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT02)	43108	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT01)	43109	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
LEADER NUMBER(TT10)	43110	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
ALTITUDE 1000	43113	4			5VDC=50M/GND=+,-		1	2	2
ALT OFFSET POLARITY	43114	4			5VDC=+,50/GND=-		1	2	2
TRACK OFFSET (X10K)	43118	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (Y8K)	43119	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (Y4K)	43120	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (Y2K)	43121	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
TRACK OFFSET (Y1K)	43122	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
LEFT/RIGHT SWITCH	43123	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y4K)	43124	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y2K)	43125	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y1K)	43126	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y200)	43127	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y400)	43128	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y800)	43129	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
XTK OFFSET (Y100)	43130	4	+5 VDC TO 0 VDC		GND=1/5VDC=0		1	2	2
LEADER SW (TT205)	43131	4	0 TO 5 VDC		GND=1/5VDC=0		1	2	2
PROX WRNG SW(P458)	43135	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
PROX WRNG SW(P454)	43136	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2

6 5 0 THRUST PROCESSOR 3 INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
PROX WRNG SW(P.52)	43137	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
PROX WRNG SW(P.51)	43138	4	0 TO 5 VDC		5VDC=1/GND=0		1	2	2
EDGE LIGHT	21137	4	26 VDC				1	2	2
ALT OFFSET VOLTAGE	43115	5	+2.7 TO 5.1 VDC				11	2	22
RANGE DELAY	21119	1	+5 VDC				1	4	4
DE- 1 (IN)	80027	1					1	8	8
DE- 2 (IN)	80031	1					1	8	8
MFDC2- 1 (IN)	80138	1					1	8	8
MFDC2- 2 (IN)	80139	1					1	8	8
MFDC2- 3 (IN)	80140	1					1	8	8
MFDC2- 4 (IN)	80141	1					1	8	8
MFDC2- 5 (IN)	80142	1					1	8	8
MFDC2- 6 (IN)	80143	1					1	8	8
MFDC2- 7 (IN)	80144	1					1	8	8
MFDC2- 8 (IN)	80145	1					1	8	8
MFDC2- 9 (IN)	80146	1					1	8	8
MFDC2-10 (IN)	80147	1					1	8	8
MFDC2-11 (IN)	80148	1					1	8	8
MFDC2-12 (IN)	80149	1					1	8	8
MFDC2-13 (IN)	80150	1					1	8	8
MFDC2-14 (IN)	80151	1					1	8	8
MFDC2-15 (IN)	80152	1					1	8	8
MFDC2-16 (IN)	80153	1					1	8	8
MFDC2-17 (IN)	80154	1					1	8	8
MFDC2-18 (IN)	80155	1					1	8	8
MFDC2-19 (IN)	80156	1					1	8	8
MFDC2-20 (IN)	80157	1					1	8	8
MFDC2-21 (IN)	80158	1					1	8	8

2 . 6 IDAMST PROCESSOR 3 INPUT

SIGNAL NAME	SIGIL	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFCC2-22 (IN)	80159	1					1	8	8
MFCC2-23 (IN)	80160	1					1	8	8
MFCC2-24 (IN)	80161	1					1	8	8
MFCC2-25 (IN)	80162	1					1	8	8
3-30 DC LEVEL	21141	7					11	8	88
COPILOT [illegible] (F)	24149	9					14	8	112
COPILOT [illegible]	24219	9					14	8	112
SCAN (IN)	80167	10					512	8	4096
[illegible] (IN)	80011	10					16	8	128
[illegible] (IN)	80035	10					16	8	128
IMU 1 (IN)	80019	10					32	8	256
IMU 2 (IN)	80023	10					32	8	256
IMU SYMBOL (IN)	80015	10					96	8	768
MPRG 1 (IN)	80005	10					512	64	32758
MPRG 2 (IN)	80007	10					512	64	32768

8.3.0 IDAMST PROCESSOR 3

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
ENGINE 1 LOOP A	8002	4					1	2	2
ENGINE 1 LOOP B	8004	4					1	2	2
ENGINE 2 LOOP A	8006	4					1	2	2
ENGINE 2 LOOP B	8008	4					1	2	2
STABILIZER TRIM	11001	3					1	2	2
MASTER CAUTION (C)	15002	3					1	2	2
BLC (C)	15013	3					1	2	2
ANTI-ICE (C)	15014	3					1	2	2
FUEL (C)	15015	3					1	2	2
OVERHEAD AVA(C)	15016	3					1	2	2
ELECTRICAL (C)	15017	3					1	2	2
HYDRAULIC (C)	15018	3					1	2	2
CENTER AISLE (C)	15019	3					1	2	2
ECS (C)	15020	3					1	2	2
CAUTION RECALL(C)	15021	3					1	2	2
OMEGA DISPLAY(C)	26004	10					192	2	384
ALTITUDE REFERENCE	43111	5	0 TO 5.5 VDC				11	2	22
FUSE	53081	1	115 VAC	NA	OPEN OR 115 VAC	NA	1	2	2
FUSE	53082	1	115 VAC	NA	OPEN OR 115 VAC	NA	1	2	2
POWER LAMP	53003	3	115 VAC	NA	115 VAC OR OPEN	NA	1	2	2
ACTIVITY TEST	53004	3	25 VDC	NA	25 VDC OR GND	NA	1	2	2
LAUNCH TEST	53005	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
ACTIVITY(INDICATOR)	53006	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
LAUNCH(INDICATOR)	53007	3	GROUND	NA	GROUND OR OPEN	NA	1	2	2
ACTIVITY TEST	53061	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
ACTIVITY LAMP	53062	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH LAMP	53064	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH TEST	53066	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2

A N D   LOAMST PROCESSOR 3

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
[illegible] LAMP	53079	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
[illegible]	53060	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
LAUNCH LAMP	53065	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
PRIORITY LAMP	53067	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
[illegible] LAMP	53068	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
[illegible] LAMP	53069	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
[illegible] LAMP	53070	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
[illegible]	53071	3	GROUND	NA	GROUND AND OPEN	NA	1	2	2
REMOTE LAMP	53073	3	NA	NA	OPEN AND CLOSE	NA	1	2	2
[illegible] SEP	53074	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
[illegible] LAMP	53075	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
ACTIVITY LAMP	53076	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
LAMP	53077	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
SPARE	53078	3	GROUND	NA	OPEN AND GROUND	NA	1	2	2
[illegible]	21127	1	26 VDC				1	4	4
DIST FLAG(+)	46071	1					1	4	4
SCAN +	21030	3	0 VDC				1	4	4
RANGE SEL 7-30/1	21096	3					1	4	4
RANGE SEL 7-30/5	21097	3					1	4	4
RANGE SEL 50/10	21098	3					1	4	4
RANGE SEL 120/20	21099	3					1	4	4
RANGE SEL 240/30	21100	3					1	4	4
[illegible] MODE	21106	3					1	4	4
WEATHER MODE	21107	3					1	4	4
INTERLOCK	21135	3					1	4	4
DIST X UNITS	46065	5					11	4	44
DIST X TENS	46066	5					11	4	44
DIST X HUNDS	46067	5					11	4	44

8 3 0 IDAMST PROCESSOR 3

OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
DIST Y UNITS	46068	5					11	4	44
DIST Y TENS	46069	5					11	4	44
DIST Y HUNDS	46070	5					11	4	44
AZ STAR (STBY)	21035	7					11	4	44
400 HZ MARKER BEACN	41017	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300 HZ MKR BEACON	41018	3	GND/OPEN		GND=1 OPEN=0		1	8	8
3000 HZ MKR BEACON	41019	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41078	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41079	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41080	3	GND/OPEN		GND=1/OPEN=0		1	8	8
400 HZ MARKER BEACN	41084	3	GND/OPEN		GND=1/OPEN=0		1	8	8
1300HZ MKR BEACN	41085	3	GND/OPEN		GND=1/OPEN=0		1	8	8
3000HZ MKR BEACN	41086	3	GND/OPEN		GND=1/OPEN=0		1	8	8
QUAD IDENT	51023	1	+5 VDC		5VDC=1/GND=0		1	8	8
QUAD IDENT	51024	1	+5 VDC		5VDC=1/GND=0		1	8	8
HIGH-LOW THREAT ID	51025	1	+5 VDC		5VDC=1/GND=0		1	8	8
TARGET ACQUISITION	51022	4	+5 VDC		5VDC=1/GND=0		1	8	8
28VDC IN TF	28189	4	OPEN OR 28 VDC	NA	OPEN=NOT TF MODE 28VDC=TF MODE	NA	1	8	8
TO/FROM(+FROM)	46073	5					11	8	88
DEVIATION (+LEFT)	46074	5					11	8	88
TO/FROM(+TO)	46075	5					11	8	88
DEVIATION(+RIGHT)	46076	5					11	8	88
NAV FLAG L	46077	5					11	8	88
NAV FLAG R	46078	5					11	8	88
OBS-D	46079	5					11	8	88
OBS-F	46080	5					11	8	88
OBS-B	46081	5					11	8	88
OBS-A	46082	5					11	8	88

[illegible] TARGET PROCESSOR 3

SIGNAL NAME	[illegible]	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	OUTPUT QUAN	U/R	B/R
COMMAND [illegible]	46086	9	26 VAC 400HZ				14	8	112
[illegible]	46069	9	26 VAC 400HZ				14	8	112
SCL[illegible] (OUT)	80159	10					16	8	128
[illegible] (OUT)	80012	10					16	8	128
[illegible] (OUT)	80036	10					32	8	256
IMA 1 (OUT)	80020	10					32	8	256
IMA 2 (OUT)	80024	10					32	8	256
TEM 1 (OUT)	80028	10					96	8	768
TEM 2 (OUT)	80032	10					96	8	768
IMA SYMBOL (OUT)	80016	10					16	8	128
HAND CONTLR 1(OUT)	80043	3					1	8	8
HAND CONTLR 2(OUT)	80044	3					1	8	8
HAND CONTLR 3(OUT)	80045	3					1	8	8
HAND CONTLR 4(OUT)	80046	3					1	8	8
HAND CONTLR 5(OUT)	80047	3					1	8	8
HAND CONTLR 6(OUT)	80048	3					1	8	8
HAND CONTLR 7(OUT)	80049	3					1	8	8
HAND CONTLR 8(OUT)	80050	3					1	8	8
HAND CONTLR 9(OUT)	80051	3					1	8	8
HAND CONTLR10(OUT)	80052	7					11	8	88
HAND CONTLR11(OUT)	80053	7					11	8	88
MFCC2- 1 (OUT)	80113	3					1	8	8
MFCC2- 2 (OUT)	80114	3					1	8	8
MFCC2- 3 (OUT)	80115	3					1	8	8
MFCC2- 4 (OUT)	80116	3					1	8	8
MFCC2- 5 (OUT)	80117	3					1	8	8
MFCC2- 6 (OUT)	80118	3					1	8	8
MFCC1- 7 (OUT)	80119	3					1	8	8

8 . 0 IDAMST PROCESSOR 3

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFDC2- 8 (OUT)	80120	3					1	8	8
MFDC2- 9 (OUT)	80121	3					1	8	8
MFDC2-10 (OUT)	80122	3					1	8	8
MFDC2-11 (OUT)	80123	3					1	8	8
MFDC2-12 (OUT)	80124	3					1	8	8
MFDC2-13 (OUT)	80125	3					1	8	8
MFDC2-14 (OUT)	80126	3					1	8	8
MFDC2-15 (OUT)	80127	3					1	8	8
MFDC2-16 (OUT)	80128	3					1	8	8
MFDC2-17 (OUT)	80129	3					1	8	8
MFDC2-18 (OUT)	80130	3					1	8	8
MFDC2-19 (OUT)	80131	3					1	8	8
MFDC2-20 (OUT)	80132	3					1	8	8
MFDC2-21 (OUT)	80133	3					1	8	8
MFDC2-22 (OUT)	80134	3					1	8	8
MFDC2-23 (OUT)	80135	3					1	8	8
MFDC2-24 (OUT)	80136	3					1	8	8
MFDC2-25 (OUT)	80137	3					1	8	8
CCA 2	80062	3					1	8	8
45 DEFLECTION	53095	5	0 TO 25 VDC	NA	NA	5	11	16	176
225 DEFLECTION	53096	5	0 TO 25 VDC	NA	NA	5	11	16	176
315 DEFLECTION	53097	5	0 TO 25 VDC	NA	NA	5	11	16	176
135 DEFLECTION	53098	5	0 TO 25 VDC	NA	NA	5	11	16	176
SCAN A	21092	3	0 VDC				1	16	16
150-ECHO LEVEL	21126	5					11	16	176
AZ STAB (SIN)	21093	7					11	16	176
AZ STAB (COS)	21094	7					11	16	176
ALTITUDE	21133	7					11	16	176

[illegible] IRAYST PROCESSOR 3

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	3/R
[illegible] RANGE	21134	7					11	16	176
AZ CURSOR (SIN,COS)	21122	18					14	16	224
AIR SPEED	28217	5	0 TO +2.2 VDC	0 TO -2.2 DEG	1VDC/1DEG	0.5 %	11	32	352
G[illegible]	28219	5	0 TO +15 VDC	0 TO 593 KTS	150MV/7KTS	0.5 %	11	32	352
TF RELIABILITY	28193	1	OPEN OR +0.380 VDC	NA	OPEN=TF OK .380VDC=TF NO OK	NA	1	32	32
SET RANGE TEST	28173	4	OPEN OR 28VDC	NA	OPEN=NO RANGE 28VDC=RANGE	NA	1	32	32
TF RELIABILITY	28192	5	0 TO +2.2 VDC	0 TO -2.2 DEG	1VDC/DEG	NA	11	32	352
RADAR ALTITUDE	28163	5	0 TO +25 VDC	0 TO 5,000 FT	35MV/7FEET	7 FEET	11	32	352
LOC DEVIATION	41063	6					11	32	352
GS DEVIATION	41064	6					11	32	352
LOC FLAG OUTPUT	41065	6					11	32	352
GS FLAG OUTPUT	41066	6					11	32	352
DIFF ALTITUDE OTPT	43112	5					11	32	352
HUD OFF FAILED RTN	28171	1	0 OR 5 VDC	NA	OPEN=HUD ON/OK 5VDC=HUD OF/FAIL	NA	1	32	32
DATA WORD	28222	10	0 OR 5 VDC	NA	NA	NA	128	32	4096
DATA WORD ID	28223	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA WORD ID	28224	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA READY	28225	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA READY	28226	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA CLOCK	28227	10	0 OR 5 VDC	NA	NA	NA	16	32	512
DATA CLOCK	28228	10	0 OR 5 VDC	NA	NA	NA	16	32	512
PROG 1 (OUT)	50006	10					16	64	1024
PROG 2 (OUT)	50008	10					16	64	1024

8 5 D ZDAMST CONTROLS AND DISPLAYS INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SCAN (OUT)	80166	10					16	8	128
SCAN (OUT)	80163	10					16	8	128
DSMU (OUT)	80010	10					16	8	128
DS U (OUT)	80012	10					16	8	128
MML (OUT)	80034	10					32	8	256
MMX (OUT)	80036	10					32	8	256
IMX 1 (OUT)	80018	10					32	8	256
IMX 2 (OUT)	80022	10					32	8	256
DEX 2 (OUT)	80030	10					96	8	768
IMX 1 (OUT)	80020	10					32	8	256
IMX 2 (OUT)	80024	10					32	8	256
DEX 1 (OUT)	80026	10					96	8	768
DEX 1 (OUT)	80028	10					96	8	768
DEX 2 (OUT)	80032	10					96	8	768
IMX SYMBOL (OUT)	80014	10					16	8	128
IMX SYMBOL (OUT)	80016	10					16	8	128
HAND CONTLR 1(OUT)	80043	3					1	8	8
HAND CONTLR 2(OUT)	80044	3					1	8	8
HAND CONTLR 3(OUT)	80045	3					1	8	8
HAND CONTLR 4(OUT)	80046	3					1	8	8
HAND CONTLR 5(OUT)	80047	3					1	8	8
HAND CONTLR 6(OUT)	80048	3					1	8	8
HAND CONTLR 7(OUT)	80049	3					1	8	8
HAND CONTLR 8(OUT)	80050	3					1	8	8
HAND CONTLR 9(OUT)	80051	3					1	8	8
HAND CONTLR10(OUT)	80052	7					11	8	88
HAND CONTLR11(OUT)	80053	7					11	8	88
MISSION PROG(OUT)	80170	10					512	64	32768

8 5 0 ICAMST CONTROLS AND DISPLAYS INPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
DATA RECORDER(OUT)	B0172	10					32	8	256
RFDS 1 (OUT)	B0002	10					16	64	1024
RPDS 1 (OUT)	B0006	10					16	64	1024
RPDS 2 (OUT)	B0004	10					16	64	1024
RPDS 2 (OUT)	B0008	10					16	64	1024
MFDC1- 1 (OUT)	B0063	3					1	8	8
MFDC1- 2 (OUT)	B0064	3					1	8	8
MFDC1- 3 (OUT)	B0065	3					1	8	8
MFDC1- 4 (OUT)	B0066	3					1	8	8
MFDC1- 5 (OUT)	B0067	3					1	8	8
MFDC1- 6 (OUT)	B0068	3					1	8	8
MFDC1- 7 (OUT)	B0069	3					1	8	8
MFDC1- 8 (OUT)	B0070	3					1	8	8
MFDC1- 9 (OUT)	B0071	3					1	8	8
MFDC1-10 (OUT)	B0072	3					1	8	8
MFDC1-11 (OUT)	B0073	3					1	8	8
MFDC1-12 (OUT)	B0074	3					1	8	8
MFDC1-13 (OUT)	B0075	3					1	8	8
MFDC1-14 (OUT)	B0076	3					1	8	8
MFDC1-15 (OUT)	B0077	3					1	8	8
MFDC1-16 (OUT)	B0078	3					1	8	8
MFDC1-17 (OUT)	B0079	3					1	8	8
MFDC1-18 (OUT)	B0080	3					1	8	8
MFDC1-19 (OUT)	B0081	3					1	8	8
MFDC1-20 (OUT)	B0082	3					1	8	8
MFDC1-21 (OUT)	B0083	3					1	8	8
MFDC1-22 (OUT)	B0084	3					1	8	8
MFDC1-23 (OUT)	B0085	3					1	8	8

8 5 0 IDAPST CONTROLS AND DISPLAYS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFDC1-24 (OUT)	80086	3					1	8	8
MFDC1-25 (OUT)	80087	3					1	8	8
MFDC2- 1 (OUT)	80113	3					1	8	8
MFDC2- 2 (OUT)	80114	3					1	8	8
MFDC2- 3 (OUT)	80115	3					1	8	8
MFDC2- 4 (OUT)	80116	3					1	8	8
MFDC2- 5 (OUT)	80117	3					1	8	8
MFDC2- 6 (OUT)	80118	3					1	8	8
MFDC1- 7 (OUT)	80119	3					1	8	8
MFDC2- 8 (OUT)	80120	3					1	8	8
MDFC2- 9 (OUT)	80121	3					1	8	8
MFDC2-10 (OUT)	80122	3					1	8	8
MDFC2-11 (OUT)	80123	3					1	8	8
MDFC2-12 (OUT)	80124	3					1	8	8
MFDC2-13 (OUT)	80125	3					1	8	8
MFDC2-14 (OUT)	80126	3					1	8	8
MFDC2-15 (OUT)	80127	3					1	8	8
MFDC2-16 (OUT)	80128	3					1	8	8
MFDC2-17 (OUT)	80129	3					1	8	8
MFDC2-18 (OUT)	80130	3					1	8	8
MFDC2-19 (OUT)	80131	3					1	8	8
MFDC2-20 (OUT)	80132	3					1	8	8
MFDC2-21 (OUT)	80133	3					1	8	8
MFDC2-22 (OUT)	80134	3					1	8	8
MFDC2-23 (OUT)	80135	3					1	8	8
MFDC2-24 (OUT)	80136	3					1	8	8
MFDC2-25 (OUT)	80137	3					1	8	8
CCA 1	80061	3					1	8	8

8 5 0 IDAMST CONTROLS AND DISPLAYS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	INPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
CCA 2	00062	3					1	8	8

8 6 0 ICAMST CONTROLS AND DISPLAYS OUTPUT

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
SCAN (IN)	80165	10					512	8	4096
SCAN (IN)	80167	10					512	8	4096
GS U (IN)	80009	10					16	8	128
GS/U (IN)	80011	10					16	8	128
MMK (IN)	80033	10					16	8	128
MMK (IN)	80035	10					16	8	128
IMK 1 (IN)	80017	10					32	8	256
IMK 2 (IN)	80021	10					32	8	256
DEK 1 (IN)	80027	1					1	8	8
IMK 1 (IN)	80019	10					32	8	256
IMK 2 (IN)	80023	10					32	8	256
DEK 1 (IN)	80025	1					1	8	8
DEK 2 (IN)	80029	1					1	8	8
DEK 2 (IN)	80031	1					1	8	8
IMK SYMBOL (IN)	80013	10					96	8	768
IMK SYMBOL (IN)	80015	10					96	8	768
MISSION ADDR(IN)	80169	10					32	8	256
MFDC2- 1 (IN)	80138	1					1	8	8
MFDC2- 2 (IN)	80139	1					1	8	8
MFDC2- 3 (IN)	80140	1					1	8	8
MFDC2- 4 (IN)	80141	1					1	8	8
MFDC2- 5 (IN)	80142	1					1	8	8
MFDC2- 6 (IN)	80143	1					1	8	8
MFDC2- 7 (IN)	80144	1					1	8	8
MFDC2- 8 (IN)	80145	1					1	8	8
MFDC2- 9 (IN)	80146	1					1	8	8
MFDC2-10 (IN)	80147	1					1	8	8
MFDC2-11 (IN)	80148	1					1	8	8

1 5 0 ICAMST CONTROLS AND DISPLAYS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFDC2-12 (IN)	80149	1					1	8	8
MFDC2-13 (IN)	80150	1					1	8	8
MFDC2-14 (IN)	80151	1					1	8	8
MFDC2-15 (IN)	80152	1					1	8	8
MFDC2-16 (IN)	80153	1					1	8	8
MFDC2-17 (IN)	80154	1					1	8	8
MFDC2-18 (IN)	80155	1					1	8	8
MFDC2-19 (IN)	80156	1					1	8	8
MFDC2-20 (IN)	80157	1					1	8	8
MFDC2-21 (IN)	80158	1					1	8	8
MFDC2-22 (IN)	80159	1					1	8	8
MFDC2-23 (IN)	80160	1					1	8	8
MFDC2-24 (IN)	80161	1					1	8	8
MFDC2-25 (IN)	80162	1					1	8	8
DITS RECORDER(IN)	80171	10					512	8	4096
MPDG 1 (IN)	80001	10					512	64	32768
MPDG 1 (IN)	80005	10					512	64	32768
MPDG 2 (IN)	80003	10					512	64	32768
MPDG 2 (IN)	80007	10					512	64	32768
MFDC1- 1 (IN)	80088	1					1	8	8
MFDC1- 2 (IN)	80089	1					1	8	8
MFDC1- 3 (IN)	80090	1					1	8	8
MFDC1- 4 (IN)	80091	1					1	8	8
MFDC1- 5 (IN)	80092	1					1	8	8
MFDC1- 6 (IN)	80093	1					1	8	8
MFDC1- 7 (IN)	80094	1					1	8	8
MFDC1- 8 (IN)	80095	1					1	8	8
MFDC1- 9 (IN)	80096	1					1	8	8

8 5 0 IDAMST CONTROLS AND DISPLAYS

SIGNAL NAME	SIGID	TYPE	VOLTAGE RANGE	PARAMETER RANGE	OUTPUT SCALE FACTOR	RESOLUTION	QUAN	U/R	B/R
MFDC1-10 (IN)	80097	1					1	8	8
MFDC1-11 (IN)	80098	1					1	8	8
MFDC1-12 (IN)	80099	1					1	8	8
MFDC1-13 (IN)	80100	1					1	8	8
MFDC1-14 (IN)	80101	1					1	8	8
MFDC1-15 (IN)	80102	1					1	8	8
MFDC1-16 (IN)	80103	1					1	8	8
MFDC1-17 (IN)	80104	1					1	8	8
MFDC1-18 (IN)	80105	1					1	8	8
MFDC1-19 (IN)	80106	1					1	8	8
MFDC1-20 (IN)	80107	1					1	8	8
MFDC1-21 (IN)	80108	1					1	8	8
MFDC1-22 (IN)	80109	1					1	8	8
JFDC1-23 (IN)	80110	1					1	8	8
MFDC1-24 (IN)	80111	1					1	8	8
MFDC1-25 (IN)	80112	1					1	8	8